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Commonwealth of Pennsylvania

DEPARTMENT OF AGRICULTURE

BULLETIN No. 222.

PROCEEDINGS OF THE THIRTY-FIFTH ANNUAL MEETING

OF THE

Pennsylvania State Board of Agriculture

HELD IN THE

CAUCUS ROOM, HOUSE OF REPRESENTATIVES, HARRISBURG, PA.

January 24 and 25, 1912.

HARRISBURG:
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MEMBERS

OF THE

PENNSYLVANIA STATE BOARD OF AGRICULTURE,

FOR THE YEAR 1912

MEMBERS EX-OFFICIO

HON. JOHN K. TENER, Governor
HON. HENRY HOUCK, Secretary of Internal Affairs
DR. N. C. SCHAEFFER, Superintendent of Public Instruction
DR. EDWIN ERLE SPARKS, President of the State College
HON. A. E. SISSON, Auditor General
HON. N. B. CRITCHFIELD, Secretary of Agriculture

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R. I. Young, Middletown, Dauphin County,	Term expires 1911
Gen. James A. Beaver, Bellefonte, Centre County,	Term expires 1913
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APPOINTED BY THE PENNSYLVANIA BRANCH OF THE AMERICAN POULTRY ASSOCIATION

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C. S. Swanson (Alternate),	Philadelphia,	1912

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			Term expires.
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Allegheny,	A. J. Purdy,	Imperial, R. F. D. No. 1,	1915
Armstrong,	S. S. Blyholder,	Kelly Station,	1914
Beaver,	A. L. McKibben,	New Sheffield,	1914

			Term expires.
Bedford,	Wm. F. Biddle,	Everett,	1915
Berks,	H. G. McGowan,	Geiger's Mills,	1913
Blair,	W. Frank Beck,	Altoona,	1914
Bradford,	F. D. Kerrick,	Towanda,	1913
Bucks,	B. Frank Wambold,	Sellersville,	1914
Butler,	W. H. Milliron,	Euclid,	1914
Cambria,	Jas. Westrick,	Patton, R. F. D. No. 2,	1913
Cameron,			
Carbon,			
Centre,	John A. Woodward,	Howard,	1915
Chester,	M. E. Conard,	Westgrove,	1915
Clarion,	J. H. Wilson,	Clarion,	1913
Clearfield,	Peter Gearhart,	Clearfield,	1913
Clinton,	J. A. Herr,	Millhall, R. F. D.,	1914
Columbia,	A. P. Young,	Millville,	1912
Crawford,	J. S. Patton,	Hartstown,	1914
Cumberland,			
Dauphin,	Edward S. Keiper,	Middletown,	1914
Delaware,	E. J. Durnall,	Swarthmore,	1914
Elk,	John M. Wittman,	St. Mary's,	1915
Erie,			
Fayette,			
Forest,			
Franklin,	John P. Young,	Marion,	1914
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Greene,	N. M. Biddle,	Carmichaels,	1913
Huntingdon,	Geo. G. Hutchison,	Warrior's Mark,	1915
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Jefferson,	Peter B. Cowan,	Brookville,	1913
Juniata,	Matthew Rodgers,	Mexico,	1915
Lackawanna,	Horace Seamans,	Factoryville,	1913
Lancaster,	J. Aldus Herr,	Lancaster,	1914
Lawrence,	Sylvester Shaffer,	New Castle,	1913
Lebanon,	H. C. Snavely,	Cleona,	1913
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Lycoming,	A. J. Kahler,	Hughesville,	1915
McKean,	O. W. Abbey,	Turtle Point,	1913
Mercer,	W. C. Black,	Mercer,	1914
Mifflin,	M. M. Naginey,	Milroy,	1913
Monroe,	F. S. Brong,	Saylorsburg,	1913
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Montour,	J. Miles Derr,	Milton, R. F. D.,	1913
Northampton,	C. S. Messinger,	Tatamy,	1915
Northumberland,	I. A. Eschbach,	Milton, R. F. D.,	1914
Perry,	A. T. Holman,	Millerstown,	1913
Philadelphia,	David Rust,	Philadelphia,	1913
Pike,	B. F. Killam,	Paupack,	1915
Potter,			
Schuylkill,	John Shoener,	New Ringgold,	1913
Snyder,			
Somerset,	John C. Weller,	Rockwood,	1914
Sullivan,	J. G. Cott.	Forksville,	1915
Susquehanna,	Frank A. Davies,	Montrose,	1913
Tioga,	Calvin H. DeWitt,	Mansfield,	1914
Union,	J. Newton Glover,	Vicksburg,	1914
Venango,			
Warren,	R. J. Weld,	Sugargrove,	1914
Washington,	D. S. Taylor,	Burgettstown,	1914
Wayne,	Warren E. Perham,	Pleasant Mount,	1914
Westmoreland,	M. P. Shoemaker,	Greensburg,	1913
Wyoming,	D. A. Knuppenburg,	Lake Carey,	1913
York,	G. F. Barnes,	Rossville,	1914

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I. A. Eschbach,	Milton, R. F. D.
John H. Schultz,	Norristown

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P. S. Fenstermaker,	Allentown
A. T. Holman,	Millerstown
Wm. F. Biddle,	Everett, R. F. D.
H. C. Snavely,	Cleona
Dr. M. E. Conard,	Westgrove
D. S. Taylor,	Burgettstown
W. C. Black,	Mercer
N. B. Critchfield, Secretary,	Harrisburg

ADVISORY COMMITTEE, CONSULTING SPECIALISTS AND STANDING COMMITTEES AS REPORTED BY THE EXECUTIVE COMMITTEE

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A. T. Holman,	Millerstown
M. M. Naginey,	Milroy

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Matthew Rodgers,	Mexico
Joel A. Herr,	Millhall
M. P. Shoemaker,	Greensburg
P. S. Fenstermaker,	Allentown

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Pomologist,	Chester J. Tyson,	Floradale
Chemist,	Dr. Wm. Frear,	State College
Veterinary Surgeon,	Dr. C. J. Marshall,	Harrisburg
Sanitation and Health,	Dr. W. Frank Beck,	Altoona
Microscopist and Hygienist	Prof. J. W. Kellogg,	Harrisburg
Entomologist,	Prof. Franklin Menges,	York
Ornithologist,	Prof. H. A. Surface,	Harrisburg
Meteorologist,	E. R. Demain,	Harrisburg
Mineralogist,	Dr. Isaac A. Harvey,	Lock Haven
Apiarist,	H. C. Klinger,	Liverpool
Economic Geologist,	Baird Halberstadt,	Pottsville
Agricultural Geologist,	W. H. Stout,	Pinegrove
Forests and Forestry,	Robert S. Conklin,	Harrisburg
Feeding Stuffs,	G. G. Hutchison,	Warrior's Mark

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LEGISLATION

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Peter Gearhart,	Clearfield
E. J. Durnall,	Swarthmore
S. S. Blyholder,	Kelly Station
Calvin H. DeWitt,	Mansfield

CEREALS AND CEREAL CROPS

J. Newton Glover, Chairman,	Vicksburg

ROADS AND ROAD LAWS

J. L. Patterson, Chairman,	McConnellsburg

FRUIT AND FRUIT CULTURE

Wm. F. Biddle, Chairman,	Everett, R. F. D.

DAIRY AND DAIRY PRODUCTS

R. J. Weld, Chairman,	Sugargrove

FERTILIZERS

J. Aldus Herr, Chairman,	Lancaster

WOOL AND TEXTILE FIBERS

D. S. Taylor, Chairman,	Burgettstown

LIVESTOCK

Dr. M. E. Conard, Chairman,	Westgrove

POULTRY

W. Theo. Wittman, Chairman,	Allentown

PROCEEDINGS OF THE THIRTY-FIFTH ANNUAL MEETING OF THE STATE BOARD OF AGRICULTURE, HELD IN THE HOUSE OF REPRESENTATIVES CAUCUS ROOM, CAPITOL BUILDING, HARRISBURG, PA., JANUARY 24 AND 25, 1912.

Harrisburg, Pa., January 24, 1912.

Vice-President G. G. Hutchison in the Chair.

The CHAIRMAN: The Board will please come to order, and the Secretary will call the roll.

The roll of members was then called by the Secretary, and at this and subsequent roll calls the following persons answered:

R. H. Thomas, Jr., Gen. James A. Beaver, A. I. Weidner, A. J. Purdy, Wm. F. Biddle, H. G. McGowan, W. Frank Beck, F. D. Kerrick, B. Frank Wambold, W. H. Milliron, John A. Woodward, M. E. Conard, J. H. Wilson, Peter Gearhart, J. A. Herr, A. P. Young, John M. Wittman, John P. Young, J. L. Patterson, Geo. G. Hutchison, S. C. George, Matthew Rodgers, Horace Seamans, J. Aldus Herr, Sylvester Shaffer, H. C. Snavely, P. S. Fernstermaker, J. E. Hildebrant, A. J. Kahler, W. C. Black, M. M. Naginey, F. S. Brong, John H. Schultz, J. Miles Derr, C. S. Messinger, I. A. Eschbach, A. T. Holman, B. F. Killam, John Shoener, John C. Weller, Frank A. Davies, Calvin H. DeWitt, J. Newton Glover, D. S. Taylor, M. P. Shoemaker, D. A. Knuppenburg and G. F. Barnes.

Ex-Officio Members: Dr. N. C. Schaeffer, Superintendent of Public Instruction; Dr. Edwin Erle Sparks, President of the State College, and Hon. N. B. Critchfield, Secretary of Agriculture.

The following consulting specialists were also in attendance: Prof. J. W. Kellogg, Microscoptist and Hygienist; Prof. Franklin Menges, Entomologist; Prof. H. A. Surface, Ornithologist; Baird Halberstadt, Mineralogist; H. C. Klinger, Apiarist; Dr. Isaac A. Harvey, Economic Geologist; W. H. Stout, Agricultural Geologist; Robert Conklin, Forests and Forestry; G. G. Hutchison, Feeding Stuffs.

The SECRETARY: (After calling of roll). There is a quorum present, Mr. Chairman.

The CHAIRMAN: We are now ready to proceed with the reading of the minutes. The Secretary will now read the minutes of the Spring Meeting of State Board of Agriculture, held in the Court House at Lancaster, Pa., May 23, 1911.

The minutes were then read by the Secretary.

The CHAIRMAN: Gentlemen, you have heard the reading of the minutes. Are there any corrections?

There being no corrections, on motion, properly seconded and carried in the regular way, the minutes were approved as read.

The CHAIRMAN: The next item on the program calls for the report of the Committee on Credentials; I will appoint on this committee the following gentlemen:

Peter Gearhart, of Clearfield; S. C. George, of Indiana; John H. Schultz, of Montgomery; I. A. Eschbach, of Northumberland; J. Newton Glover, of Union and M. P. Shoemaker, of Westmoreland.

If there are any Granges or other organizations who have sent representatives here, please turn over your Credentials to this committee and they will be passed upon.

The SECRETARY: There is no other committee to be appointed at this time.

The CHAIRMAN: The next thing in order is Item 5, on the program: Reports of Standing Committees. The first of these is the Report of J. Miles Derr, on Cereals and Cereal Crops.

Mr. Derr's report is as follows:

REPORT OF THE COMMITTEE ON CEREALS AND CEREAL CROPS

By J. MILES DERR, *Chairman.*

Agriculture is really our most important industry because it furnishes so many raw materials for our manufacturers. Flour could not be made without wheat, nor cloth without cotton, wool or other fibre. Of all our farm products, the grains or "cereals," are the most valuable. They are the seeds of certain cultivated grasses, growing in all climates, from the Equator to the Arctic Circle.

In many respects, wheat may be considered the "King of the Cereals;" while as a wealth producer, "Corn is King," with a value more than twice that of the cotton crop this year, and but little less than the combined values of the cotton, wheat and oats crops. Corn is by far the leading crop of the United States as a wealth producer.

The estimate of 2,776,000,000 bushels indicates a production that has been exceeded only in two years. The farm price of corn is now high, and this establishes a total value for the crop that reaches $1,700,000,000 and breaks the record. According to this year's report, it has been proven that a large crop may be worth less to the producer than a small one and a small crop may be worth more than a large one.

The cotton crop of this year, commonly supposed to be the largest one ever grown, has reached a price of lint that is five cents a pound below that of last year, and for the same reason the price of seed has declined. Apparently, the value of fibre and seed of this year's crop is below the value of the last two years, although above the value of the five preceding years. There is no crop that this country produces that excites such world-wide interest as cotton, for the reason that the crop of the United States is about three-fourths of the world's production.

Barley is a crop this year deficient in production. The 146,000,000 bushels are 12 per cent. below the last five year average; but the total value of the crop is about $125,000,000, and much above the record value of 1907.

In this report I desire to confine my remarks to wheat, and try to give some reasons why we should produce better crops of this important cereal in our State.

WHEAT FALLING OFF

Wheat has fallen from second to fourth in order of value, and is worth $600,000,000. The estimate of the Department places the production this year at 656,000,000 bushels, an amount that would have been much exceeded had weather conditions been more favorable and less Hessian fly. This country produced one-fifth of the world's wheat crop during the last five years, and contributed about one-eighth of the world's exports. The world's wheat crop is about 3,162,000,000 bushels, and is about two bushels apiece for the world's people.

Wheat is one of the most important grains known to man. Although wheat was not known in this hemisphere before Columbus came, our continent now produces more wheat than any of the other grand divisions of the globe. We send millions of bushels of wheat annually across the Atlantic, and, with the exception of cotton, we get more for our wheat from foreign countries than for any other crop.

In Minnesota and the Dakotas there is a region known as the Red River Valley which might be called the "Bread Basket of North America." The wheat farms there are of vast extent and are managed on a grand scale.

Kansas has for several years held the honor of being the greatest wheat-producing state in the Union. North Dakota ranks second among the wheat-producing states, and has immense farms in the valley of the Red River, in some instances, containing as many as 30,000 acres. Each of these is operated under a highly developed system, and in summer often employs from 200 to 300 men.

The soil of North Dakota is a rich alluvial loam, ranging from six inches to three feet, with a clay subsoil that retains the natural moisture. These conditions create the wonderful productivity that has given the Dakotas a world-wide fame. On the great "bonanza farms" of the eastern counties may be seen grain fields often miles in extent, and in harvest time, with the long line of reapers sweeping across a yellow set of standing grain, they present a scene that fills the mind of the on-looker with admiration.

The largest percentage of acreage in Minnesota is devoted to the cultivation of its wheat crop, and the state ranks third in the value of its wheat crop.

Across the border line from Minnesota into Canada we find about 4,000 square miles of the richest wheat land in the world. The deposits of clay and silt left by the receding Lake Agassiz, overlaid by from two to four feet of black vegetable mold, are the fertile wheat lands of Manitoba. The soil is a rich, deep loam resting on a deep clay subsoil. It is well adapted to wheat growing. In 1902, when the harvest was exceptionally good, the yield of the province averaged 26 bushels to the acre.

HARVESTING ON A GREAT WHEAT FARM

On the immense wheat farms of the Pacific Coast, the most elaborate devices have been called into play to serve the grain growers It is only these states of the Far West that there can be seen in operation the combined harvester and thresher, a miracle of modern invention, which dragged slowly across a field, cuts the standing grain, threshes it as it moves, and drops the filled and tied sacks to be gathered up by the wagons that follow. Some of these great machines are drawn by steam engines; others by teams of twenty-five to thirty horses and mules. A single machine with four men will gather and thresh from seventeen hundred to three thousand bushels of wheat in a day.

But how are these great crops of wheat cared for after they leave the field? This is almost as great a business as raising the wheat. At some of the railroad stations and at all the large grain ports, there are large elevators, or granaries, for storing grain until it is wanted for sale. There are such granaries at New York and New Orleans, and at all the large cities upon the Great Lakes. There are many of them at Minneapolis, and a single one has storage room for more than a million bushels of grain. The elevators at Minneapolis alone can hold almost thirty million bushels at one time.

Elevators are usually built along the wharf and by the railroad siding. Some of them are built as high as a six-story house. The grain is moved to the upper part of the mill by an endless chain of little buckets of tin or zinc, there it is weighed and poured into the deep bins. When it is taken out it flows through pipes into the cars or the ships which are to carry it to the markets.

There are elevators of this kind at the ports at the head of Lake Superior, into which the grain is taken from the cars, and later poured into the steamers which are to take it down the Great Lakes to Buffalo, whence it is carried through the Erie Canal to New York, to be shipped to Europe.

Minneapolis is a magnificent city of more than a quarter of a million inhabitants. It is situated on the Mississippi, at the falls of St. Anthony. These falls furnish a water power as great as could be given by forty thousand horses pulling at once, and their situation so near our wheat lands has made Minneapolis one of the milling centers of the world. There are numbers of big flour mills here which are grinding away day and night. One single mill can grind twenty thousand barrels of flour in a day.

HOW THE GREAT LAKES BENEFIT THE FARMERS OF THE GREAT WHEAT FARMS OF THE NORTHWEST AND EQUALIZE THE PRICES OF CEREALS IN OUR COUNTRY

Duluth and Superior City, built at the western end of Lake Superior, are at the head of navigation on the Great Lakes. They have fine harbors and great docks and grain elevators are built there. Duluth is at the eastern end of the Northern Pacific Railroad, and receives immense quantities of wheat from the large farms of the valley of the Red River, which is probably the most perfect wheat farming region in the world.

Let us now listen to how the grain is taken from the great elevators and carried to the eastern and foreign markets. We may see the famous whaleback steamships which carry immense quantities of iron ore and grain, lying under the shadows of huge wheat elevators at the wharves of Duluth. They are more like enormous barrels than like steamships, and as they lie there in the water they make us think of some sea monster or whale. They are now being filled with wheat which is poured into their holds by pipes from the elevators.

Thousands of bushels of grain will be stored in a single whaleback vessel within a few hours, and the load it will carry will be more than could be hauled by a train of two horse wagons ten miles in length. The average load of a whaleback is about 70,000 bushels of wheat.

The chain of Great Lakes forms one of the chief commercial highways of the globe. The upper portions of these lakes are frozen during the winter, and for five months they are almost as deserted as the icy seas about the North Pole. It is only during the seven warmer months that ships can navigate them; but in this time more freight is carried upon them than all that is brought into Liverpool or London in a whole year.

Were it not for these lakes our immense harvests of grain could hardly be taken to the seashore. A whaleback will steam out with its great load of 70,000 bushels of wheat to Buffalo, or it may even pass through the Welland Canal and go on down through Lake Ontario into the St., Lawrence River, and out across the Atlantic to the seaports of Europe. There is a navigable waterway from Duluth to the sea, and if the destination of our whaleback is Liverpool, it will have to travel more than half of its voyage in fresh water before it gets to the Atlantic Ocean, at the Strait of Belle Isle.

LOW FREIGHT RATES

The journey can be made so cheaply that for a few cents a bushel of wheat can be brought from the greatest wheat farms in the world, which are located in the heart of North America, to the seaboard, and for thirty cents a ton can be brought from Buffalo back to Duluth. The cost of carrying grain by water in this way is less than one-half the cost of carrying on railroads. It is this cheapness that has caused many towns and cities to spring up at the harbors along the Great Lakes, and due to these cheap freights that the price of wheat is nearly the same in Chicago as in Philadelphia and New York.

In years to come as population increases and the demand for food becomes greater, it will become necessary for the cereal farmer to pay more attention to maintaining and increasing the fertility of his soil. We have seen soils in our locality, which thirty years ago produced from 25 to 30 bushels of wheat per acre, cropped so frequently with wheat that the yield was brought down to 12 to 15 bushels per acre. The same land after changing owners, and the owner himself becoming the operator, has restored and finally increased the fertility and yield to 32 bushels per acre. What is true in this instance is true and may be in many others. We think that a greater percentage of our farms should be operated by their owners, and it appears that something must be seriously wrong or they would be.

In many states about 50 per cent. of the farms are operated by tenants. The last census report shows that nineteen counties of Pennsylvania have lost in numbers of people. Iowa, which is strictly a cereal producing state, has less people than it had ten years ago, showing that farmers and farm laborers are leaving the farm homes and going to manufacturing cities.

Pennsylvania farms should be operated by their owners, more cattle fed upon them, less grain, hay, and straw sold from them, and as a result a very much greater yield would be secured. A large percentage of our Pennsylvania soils have not been worked more than 100 years and seem to be worn out, but they are not, simply robbed and can be restored. England and Germany have worked their soils for about 2,000 years and produce about 100 per cent. more grain than we do. Let us follow their example.

The CHAIRMAN: Next is the Report of the Committee on Roads and Road Laws, Hon. J. C. Weller, Chairman.

Mr. Weller then read the following report:

REPORT OF THE COMMITTEE ON ROADS AND ROAD LAWS

By HON. J. C. WELLER, *Chairman.*

The Legislature of 1911 passed upon more road legislation of far-reaching consequences and greater importance than any previous legislation in the history of the Commonwealth. By the act of May 31, 1911, the Highway Department of the State was reorganized, consisting at present of a Highway Commissioner, a First Deputy Highway Commissioner, a Second Deputy Highway Commissioner, a Chief Engineer and a largely increased clerical force in all of its departments.

Section 6, states the purpose of this Act, that all those existing public roads, highways, turnpikes and toll roads or any parts or portions thereof, subject to the provisions hereinafter made in the case of turnpikes and tollroads forming and being main traveled roads or routes between county-seats of the several counties of the Commonwealth and main traveled roads or routes leading to the State line, and between principal cities, boroughs and towns, shall be known marked, built, rebuilt, constructed, repaired and maintained by and at the sole expense of the Commonwealth; and shall be under the exclusive authority and jurisdiction of the State Highway Department and shall constitute a system of State highways, the same being more particularly described and defined as follows: Route No. 1, from Harrisburg to Sunbury to Danville, and thus continuing Route No. 296, from Scranton to New York State line, completing a net work of highways that will connect the county seats and principal cities and boroughs of the Commonwealth.

All of which is conditioned upon Joint Resolution No. 3, passed by the last Legislature amending the Constitution of the State as follows: "That the General Assembly may authorize the State to issue bonds to the amount of fifty million of dollars for the purpose of improving and rebuilding the highways of the Commonwealth." As a rule, farming communities are not in favor of bonding the State. Where the money derived from the sale of bonds is to be used in building a system of State highways which would mean so much to the rural Commonwealth, there should be little opposition to such a plan. When the amendment is submitted to the popular vote, as it will be required after favorable action by the next Legislature, there should be no hesitancy in its adoption by a large majority of the voters of the Commonwealth. Of the provisions of the Act the one likely to meet with most serious criticism is Section 8. "Whenever in the construction, reconstruction, maintenance, and repair of any of the State highways it shall appear to the Commissioner that any part or portion of a State highway as now defined and described in this Act, is dangerous or inconvenient to the traveling public in its present location either by reason of grades, dangerous turns, or other local conditions, or that the expense to the Commonwealth in the construction, building, rebuilding, maintenance and repair thereof would be too great or unreasonable, and could be materially reduced or lessened by a divergence from the road or route, the Commissioner is hereby empowered to divert the course or direction of same and he may diverge from the line or route of same as herein described in such direction or directions as in his discretion may seem best in order to correct said danger or inconvenience or lessen the cost to the Commonwealth: Provided, that the said Commissioner shall first submit a plan of the proposed change to the Governor and the same shall be approved by him."

I fear when the day arrives when actual work begins in constructing these highways as designated by the route number, many will contain dangerous turns, too steep grades or the expense to the State in their construction will be too great, particularly to the person living some distance from the described route who, by raising a kick, would hope to have it pass by his farm or door.

This act carries with it an appropriation of three million dollars for the two years for constructing and repairing State highways, also one million dollars for building or reconstructing State aid highways, the State paying only 50 per cent. of the cost of construction and 50 per cent. of cost of repairing State aid highways. Should the provisions of this act be fully realized and the golden period dawn of this network of roads constructed extending over the State connecting the county seats and principal cities of the Commonwealth, with all the State aid highways the total number of miles would not exceed ten thousand miles or about 10 per cent. of the public roads in the State. What of the remaining 90 per cent. of public roads? Surely the local communities will have something to do in the way of road construction for many, many years to come.

Another Act passed by the Legislature of 1911 is known as the "dirt road act," which provides that each township shall receive annually from the State fifty per centum of the total amount of road tax collected by such township, as shown by the sworn statement of the board of township supervisors, contained in the annual report furnished to the State Highway Commissioner on or before the first day of January in each year as hereinafter provided for: Provided, that no township shall receive in any one year, more than twenty dollars for each mile of township road in said township; the sum of one million dollars or so much thereof as may be necessary is hereby appropriated to carry out the provisions of this act, for the two fiscal years, beginning the first day of June, A. D., 1911. This amount was reduced by the Governor to one-half million dollars, because of insufficient State revenue. This Act, to my mind, is misleading, for the reason that it would require a much larger appropriation than one million dollars to pay the fifty per centum. In my estimation, a sum equal to the amount annually appropriated to the public schools would be more nearly the amount required. Judging from my home school district the State appropriation to schools never reaches fifty per centum of the taxes raised by the school district, and the road tax rate is never less than the school rate. No township shall receive in any one year more than twenty dollars for each mile of township road in said township. From this we infer that $60.00 per mile is the average maximum amount to be applied or expended annually on roads. How far would sixty dollars go in permanently improving one mile of road? An average expenditure of sixty dollars per mile on all of the public roads in the State in the aggregate would amount to almost six million dollars annually and in ten years to sixty millions and no roads worthy of the name.

The good roads problem is surely a perplexing proposition. You cannot solve it without the expenditure of large sums of money; and possibly the recommendation of Governor Pennypacker that the natural resources of the State, coal and oil, be taxed to raise a fund for road making has the true ring, for we have numerous instances where persons have amassed great wealth from the development of these natural agencies and are donating of their means, large sums of money to objects wholly without the limits of the State. Had a portion of this money been expended in constructing good roads, it would have proved a lasting blessing and benefit to many of the citizens of the Commonwealth.

The subject of good roads is no longer one of their necessity; the greatest question is how to secure them.

The CHAIRMAN: Next is the Report of the Committee on Fruit and Fruit Culture, Mr. J. P. Young, Chairman.

Mr. Young thereupon read the following report.

REPORT OF THE COMMITTEE ON FRUIT AND FRUIT CULTURE

By J. P. YOUNG, *Chairman*

As Chairman of your Committee on Fruit and Fruit Culture, I beg leave to report as follows:

The growing of fruit in our State has been successful as well as profitable in the past and should continue, as commercial men have found that intelligently grown Pennsylvania fruit always receives the preference of the buyers.

This is the era of the boom in fruit culture. Our State is passing through such a boom in fruit culture as never has been experienced, probably anywhere in any branch of agriculture. In this boom condition of the apple industry, there is the usual exaggeration and misrepresentation.

The many apple growing stories now going the rounds of the newspapers, showing how "John Smith grew so many barrels of apples per acre and had he sold them for so much, he would have made a fortune," make good reading for our city cousins who look enviously back at the farm, forgetting that it often includes getting up at 4 A. M. It makes very good copy for the young reporter who gets paid by the inch, but it cannot help in the end to do anything but injury to the apple industry. After reading these stories, the city consumer, on whom we must in the end depend, believes that all the producer does is to plant a few trees on some worthless piece of ground, and after a little, pick a fine lot of big red apples and send them down. He growls at the grower when he pays for the fruit, forgetting that the latter gets less than half of the money.

PLANTING

A very great increase in planting has taken place. Without figures, it is safe to estimate that the number of trees has doubled during the last three years. We are not the only state showing such increase. It is true all over the country from the Atlantic to the Pacific. This great increase of planting has been largely in apples everywhere, although there has also been an extraordinary increase in the planting of peach and other fruits. However, it is clear that the apple will remain as always, "King of Fruits." In our neighboring states of Virginia and West Virginia, this immense rate of increase is even greater than here in Pennsylvania, while in New York and New England it is probably almost as great.

Through the kindness of Prof. J. P. Stewart, I am able to give his experience in orchard work, and he is regarded as one of the men who has left nothing undone to obtain the best results.

(1). His experience has shown that in some orchards, lack of plant food is the crop limiter. In such cases the gains from certain fertilization have run from 4-17 times the amount of fruit produced on the checks, and net profits have ranged from $120 to $420 per acre. Tillage and cover crops have not been the equivalent of fertilization in such orchards.

(2). That in general, the common advice to apply phosphates and potash for apples is incorrect, in the absence of nitrogen such applications, as a rule, have not paid. In its presence, however, moderate amounts of these minerals are often profitable.

Neither phosphates nor potash have had any material influence on color or size, their influence has been favorable, especially potash.

(3). Nitrogen has had greater influence in increasing yield than any other element. It also has materially decreased color. This is due primarily to delay in maturity, and may be overcome by later picking which is advantageous with such varieties as the Baldwin. The delay on it in one locality the past season was three weeks.

(4). Contrary to a prevalent notion, growth and fruiting are not antagonistic, unless either occurs in abnormal amounts. Our best growing plots, as a rule, have been our best fruiting plots.

(5). Manure has usually proved profitable, doubtless assentially because of its nitrogen contents. Whenever it has been beneficial, however, its net profits have been approached or surpassed by certain combinations of artificial fertilizers.

(6). In a few orchards, however, no form of fertilization has as yet produced material response. This we consider due to the presence of other limiters of which improper moisture supply is frequently important.

(7). The existence of such orchards emphasizes the need of local tests before making large and regular expenditures for fertilizers.

(8). In the long run, any orchard that is actively producing and growing is likely to require fertilization, since the total plant food draft of such an orchard is quite heavy, more per acre for every constituent than is required by a 25-bushel crop of wheat.

(9). Where plant food is needed, a good fertilizer is one carrying about thirty pounds actual nitrogen, fifty pounds actual phosphoric acid, and twenty-five pounds potash per acre. The nitrogen may be obtained in cover crops.

(10). Injury from fertilizer has appeared in a few cases, especially in young orchards and in connection with strong applications of muriate of potash on thin soils.

(11). Some definite correlation has appeared between certain fertilization and fire blight, the latter being worst on the manure plots and in those making strongest growth. Fruit spots also has been much worse on the manure plots in certain cases.

(12). With the four principal cultural methods tillage, tillage and cover crops, sod mulch and sod without fertilization. The second method has been best for yield and growth in a mature orchard. With fertilization, the mulch method has excelled in both matured and young orchards, and also without fertilization in the latter, sod has given the highest color in all cases.

(13). Color is essentially dependent on maturity and sunlight, conditions increasing one or both of these factors, such as late picking, light soils, open pruning and sod culture increase color. Opposite conditions decrease it. Iron application to the soil have not been shown to improve color.

SIZE OF CROP

Owing to a very favorable season in part and in part to new orchards coming into bearing, this year's apple crop was probably the largest in the history of the State. The yield of peaches and other fruits, while not a record breaker, was about the average and fair prices were received.

PRICE OF APPLES

In contrast to the fair and satisfactory prices received by the grower for his peaches, was the exceedingly low prices offered for apples. Only fruit of exceptional quality commanded a price that would justify the grower in handling it, and undesirable varieties and other than best grade fruit in many sections hardly paid the cost of harvesting.

MARKETING

One noticeable feature in the marketing of this crop, was the absence of competition among the buyers. In many districts the price offered by different buyers was practically uniform, in most cases too low to be profitable to the grower. The grower had little choice, he could either sell to the buyer at the offer made or keep his fruit. Local markets were full. Unless put into storage, the fruit would rot, but when the grower applied for storage at many plants he usually found the space already engaged. Thus, little was left for him to do but to go back to the buyer and sell at the latter's own terms. Contrasted with conditions in many of the apple growing districts was the fact that any ripe eating apple was retailing in the larger cities at a price equal to the average of other years.

VALUE OF CROP

While there are no means at hand at this early date to state accurately the value of this year's crop, it can be very safely estimated at twice that of last year, from which the grower received little larger gross returns than last year and that he received even less net returns than for a crop half the size the year before.

One of the things lacking in fruit growing, is a better organization, not for the purpose of overcharging the consumer, but for the purpose of better distribution, as it often occurs that one market is overstocked with fruit while another is wanting a supply. This would perhaps ease the city house wife's mind, as she cannot understand why the fruit growers are not all rich when she considers the enormous price she pays for fruit.

The SECRETARY: Mr. Chairman, I notice that the report of Mr. W. Theo. Wittman, Chairman of the Committee on Poultry does not appear on the program. I am not able to say for certain whether it was in the manuscript that went to the printer, but I think it was. Mr. Wittman is an authority on poultry and I would suggest that he now be given an opportunity to read his paper.

The CHAIRMAN: We will be glad to extend this opportunity to Mr. Wittman.

MR. WITTMAN: I made just the same mistake, gentlemen, but I find in looking over the program more carefully that it is there, so I owe you all an apology.

Mr. Wittman's paper follows:

REPORT OF THE COMMITTEE ON POULTRY

By W. THEO. WITTMAN, *Chairman*

Probably the most outstanding feature of the poultry situation within the State for the last year is the continued enormous increase of the amount of poultry kept by suburbanites, by villages and by city people. Practically, this is all pure bred poultry too. All of which has up to this time been reflected only in a very slight degree as regards poultry on our farms. However, already wherever there is a farm in the State that by its buildings, by its crops, and by its four-footed stock shows that its owner is progressive, there is sure to be pure-bred poultry and pure-bred poultry only. And the time is rapidly coming when at least most of the farms within the State will have reached at least that progressive stage in poultry keeping that only pure-bred flocks will be found.

Never before have the exhibits of poultry at the fall fairs been as large or so many local poultry shows been held, as this winter. Never before has the poultry press been so active; it being not unusual for one poultry paper to have hundreds and even thousands of subscribers in one county. The Philadelphia and Pittsburg Sunday papers continue to carry pages of all sorts of poultry advertising, where only a few years back they carried inches. Also farm papers, household papers and the great popular magazines even have paid much flattering attention to poultry husbandry within this last year.

Nor have as many students in any one year been enrolled as taking the poultry courses as this year at our State College. Nor has all this great increase in interest and knowledge and amount of poultry kept, as yet affected prices as some would seem to think. Or, as some would even fear, that the business be overdone. So large is the demand for fresh eggs and good table poultry, and so enormous the amount of both annually imported into the State, that it will be many years if ever that the above will come about.

What temporary slump there has been in prices in poultry meat and in eggs, was due to that the past summer was unusually favorable for the rearing of late chicks, throwing an enormous amount of killing stock on the market. And the very unusual weather conditions of December set the pullets of this late stock to laying, where usually it would have been postponed until February. In fact it set all sorts of non-winter laying fowls to laying and thus lowering the price of eggs by the unheard of increase in supply.

Most important of all, never before has the poultry industry included within its ranks so many earnest, intelligent and resourceful people, and the industry at large has in this country today *the largest and most active livestock organization in the world.* Pennsylvania has never before had so many organized poultry associations. One at least in nearly every county and in some counties two and three and even four. Its State organization, known as the Pennsylvania Branch, American Poultry Association, includes all the larger and most of the smaller of these organizations as members.

At their annual convention at Scranton last week, they transacted much important business looking towards the uplift of the poultry industry in this State; among other things, voting unanimously to make an effort to secure from the next Legislature an appropriation giving State College a suitable plant and equipment to teach poultry culture, and as auxilliary to this, an annual appropriation for the support of poultry shows, where people could be interested and shown directly and locally the work being done at State College. Also, an annual appropriation towards the support of a Division of Poultry Husbandry of the State Department of Agriculture, for the more direct benefit of the people at large wanting advice or aid or needing protection or regulation so that they may have actually fresh and clean eggs and clean and healthful meat.

The CHAIRMAN: You have all heard these papers read; what shall be done with them?

On motion properly seconded and duly carried in the regular way, they were ordered to be filed and published in the journal of proceedings.

The CHAIRMAN: These reports have all been presented and are now ready for discussion.

The SECRETARY: I would suggest that you postpone these discussions until we reach Number 7 of the program. Prof. Stewart is anxious to put up a screen for his report and I would suggest that we take a recess of 10 to 15 minutes to give him time to do this.

A recess was then taken.

After the recess, the meeting was again called to order by the Chairman.

The CHAIRMAN: Before we proceed with Prof. Stewart's lecture, is the Committee on Credentials read to report?

MR. GEARHART: It is.

The CHAIRMAN: We will then listen to this report now.

The Committee on Credentials made the following report:

REPORT OF CREDENTIAL COMMITTEE

To the Pennsylvania State Board of Agriculture in session at Harrisburg, Pa., January 24th and 25th, 1912: We the Committee on Credentials appointed to examine the credentials of the various members elected, have gone over the various credentials carefully and find them in regular form, and no contests, and recommend that the following persons be admitted as members of the State Board of Agriculture of Pennsylvania:

Lycoming county,	A. J. Kahler,	Hughesville.
Sullivan county,	J. G. Cott,	Forksville.
Bedford county,	Wm. F. Biddle,	Everett, R. F. D.
Lehigh county,	P. S. Fenstermaker,	Allentown.
Huntingdon county,	Geo. G. Hutchison,	Warrior's Mark.
Centre county,	John A. Woodward,	Howard.
Northampton county,	C. S. Messinger,	Tatamy.
Juniata county,	Matthew Rodgers,	Mexico.
Elk county,	John M. Wittman,	St. Mary's.
Adams county,	A. I. Weidner,	Arendtsville.
Pike county,	B. F. Killam,	Paupack.
Chester county,	M. E. Conard,	Westgrove.
Allegheny county,	A. J. Purdy,	Imperial.

We also recommend the following persons to be received as delegates:

Appointed by Adams County Agricultural Society, Samuel Bream; Lebanon County Agricultural and Horticultural Association, Clark G. Long, Edward Shuey, Peter R. Boltz, Fred R. Fertig, E. S. Risser, Samuel Heilman, Edgar A. Weimer, John F. Brubaker, S. P. Heilman.

Schuylkill County Agricultural and Horticultural Society, R. H. Mengel and A. W. Berkheiser.

Juniata Agricultural Society, Stewart A. Robison, J. H. Book, J. T. Seiler.

Perry County Agricultural Society, J. B. Lair, H. B. Cumbler, M. L. Ritter.

Appointed by the Pennsylvania Beekeepers Association: Wm. A. Selser, 10 Vine St., Philadelphia; C. S. Swanson, Alternate, Philadelphia.

Also the following gentlemen:

E. M. Zerr, Garfield Egelman, Berks; Jacob Reiff, Lehigh; Mr. Chubbuck, Northumberland; B. H. Ray, Pinegrove; Dr. W. F. Vallerchamp, New Berlin.

PETER GEARHART,
J. H. SCHULTZ,
I. A. ESCHBACH,
S. C. GEORGE,
J. N. GLOVER,
Committee on Credentials.

The CHAIRMAN: What is your pleasure with regard to this report so far as it refers to the members of the Board?

MR. J. A. HERR: I move it be adopted and these gentlemen be given the privilege of the floor.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: Now the delegates who have filed their credentials. What is your pleasure in regard to them?

MR. J. A. HERR: I move they be received and the gentlemen given the privilege of the floor.

This motion was properly seconded and duly carried in the regular way.

The SECRETARY: I move you that any delegates who represent any farmers organizations be admitted to seats in council with us and given the privilege of the floor, and requested to hand their names and addresses to the Secretary; that will cover every one who will come in.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: Mr. Creasy, that admits you.

The SECRETARY: We couldn't get along without Mr. Creasy. I heard one of the newspaper men say that it was like playing Hamlet with Hamlet left out with Mr. Creasy not here.

The CHAIRMAN: We are all brothers together and we hope you will all take part in the discussions. Anything that comes up in the line of Agriculture, let us have your views. Do not be afraid to express them. Let us do some good for the Commonwealth. Agriculture is taking on new life and it is no disgrace now to be a farmer.

The SECRETARY: Nor ever was.

MR. McGOWAN: Before we proceed with the discussion, I wish to announce that the Committee on Legislation will meet in this room immediately after the close of this session.

MR. J. A. HERR: Since our last meeting one of our honorary officers has been called away by death. I do not know whether any of our other members have passed away or not, but I move that a Committee on Memorial be appointed.

The SECRETARY: I second that motion.

This motion was duly carried in the regular way.

The CHAIRMAN: Mr. Herr will you please pass me up the names of four gentlemen, besides yourself, to serve on that Committee? You to be Chairman.

If any member or person present knows of any members who have passed away or ex-members of the Board, or any of the specialists, you will please make it known to Brother Herr, so that a suitable minute can be made of the death.

We will now go on with Prof. Stewart's lecture.

Prof. Stewart's lecture was illustrated, and was as follows:

THE INFLUENCE OF FERTILIZERS AND OTHER FACTORS ON YIELD, COLOR, SIZE AND GROWTH IN APPLES

DR. J. P. STEWART, *Experimental Pomologist, State College. Pa.*

The Pennsylvania Experiment Station has been conducting experiments bearing upon the above subject during the past five years. Altogether, it has now in operation 18 such experiments, involving soil types and 3,660 trees. In many respects, this series of experiments is by far the most comprehensive of any similar series thus far reported in America. In number of soil types; in number of treatments and checks; in number, variety and range of age of the trees; in duplications of the experiments of a given type; in the amounts of fruit involved; and in the fact that the experiments are distributed over the State and located, as a rule, in regions generally recognized as being well adapted to apple production; in all these respects we believe that the Pennsylvania orchard experiments enjoy distinct advantages over most previous efforts to answer the questions involved.

The results considered in the present paper are chiefly from 10 experiments, containing 2,219 bearing trees and involving 10 different types. The soil types range from heavy clay loams, in expt. 219, through silt and plain loams to light sandy and stony loams, in expts. 216 and 219. Some of the general features of these experiments are given in Table 1:

TABLE I. LOCATION, SOIL TYPES, VARIETIES AND TREES IN EXPERIMENTS AWAY FROM COLLEGE

Expt. No.	County	Soil	Varieties	Age 1911, yr.	No. of trees
215[1]	Adams,	Porters loam,	York & Stayman,	12	160
216	Franklin,	Montalto fine sandy loan.	York & Jonathan,	12	160
220	Bedford,	DeKalb stony loam,	York & Baldwin,	13 & 23	160
217	Franklin,	Montalto loam,	York & Gana,	18	358
218	Franklin,	Hagerstown clay loam,	York & Albemarle,	12 & 16	400
219	Bedford,	Frankstown stony loam,	York, Jonathan, Ben Davis & Gana.	9	320
221	Wyoming,	Chenango fine sandy loam.	Spy & Baldwin,	39	115
336	Chester,	Chester loam,	Grimes, Smokehouse & Stayman.	9 to 11	120 & 105[2]
337[3]	Mercer,	Volusia silt loam,	Spy, Baldwin & Rome,	4	180 & 180
338	Lawrence,	Volusia silt loam,	Baldwin,	23	80 & 105
339	Bradford.	Lackawanna silt loam,	Baldwin & Fallwater,	17	120 & 16

The first three experiments deal with the influence of fertilizers, and involve 10 treatments and 6 checks in each case. The next four experiments deal with cultural methods and involve 12 treatments in each case, except the last, which has six. The last four experiments are a combination of portions of the first two types and deal with both fertilizers and cultural methods.[4] As shown in the table, the trees are of 10 varieties, though with one exception there are two or more varieties in each experiment. In age at the present time, the bearing trees range from 9 to 39 years; and since the work started they have produced over 1,315,000 ℔. of fruit.

In this one item of fruit, we may call attention to the facts that, so far as American experiments are concerned, this amount is more than treble that reported in any other single experiment, and very distinctly more than the total fruit reported from all other similar experiments combined. This does not mean that the importance of the experiments elsewhere is to be minimized in the least, but it should help to emphasize the fact that, in those cases where conclusions or attitudes are in conflict, very careful attention should be given to the actual and relative amounts of evidence upon which the differing attitudes are based. In fact, within our own experiments we can find the counterparts of practically all those reported elsewhere. If we had fewer experiments—for example, only one on fertilization and another on cultural methods—our conclusions could be much more easily formulated, and we might readily become ardent partisans on either side of the questions, the side depending merely upon which of the present locations our experiments chanced

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1. The names and addresses of the owners of the orchards in which these experiments are located are as follows: 215, Tyson Brothers, Flora Dale, Pa.; 216, D. M. Wertz, Quincy; 220, Mrs. S. B. Brown, Manns Choice; 217, J. H. Ledy, Marion; 218, Ed. Nicodemus, Waynesboro; 219, J. H. Sleek, New Paris; 221, F. H. Fassett, Meshoppen; 336, A. Darlington Strode, West Chester; 337, A. M. Keifer, Greenville; 338, J. B. Johnston, New Wilmington; 339, F. T. Mynard, New Albany.

2. In the two sets of figures in this and the following experiments, the first gives the number of trees under fertilizer experiment, the second those under differing cultural methods. In Experiment 339, the latter includes only a mulch plot.

3. Trees set out in connection with these experiments and not yet in bearing, hence excluded from consideration at this time.

4. For further details, see our Bulletin 100 and our Annual Report for 1910-11.

to have. In other words, if we attempted to base our conclusions upon any one or two of our present experiments, those conclusions would be very different from any we would now formulate, on the basis of all the results. There can be no doubt that when the whole truth is known, we shall be able to account for *all* of the facts, and this is what we are undertaking to do.

THE INFLUENCE OF FERTILIZATION

The first factor to which we shall give attention is that of fertilization. Can the yield, color, size and wood-growth[5] of apples be influenced by fertilization, and, if so, how and under what conditions? This has always been an important question, and five years ago, when we were starting our experiments, we could find no data upon which to base a definite, well-founded answer. We do not say that we can fully answer it yet, but such progress as we have made may be partially seen in Tables II and III.

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[5] Quality is omitted from consideration at the present time, not because we do not consider it important, but because as yet we have no measure of quality sufficiently accurate and impersonal to enable us to make satisfactory comparisons of the fruit under different treatments.

TABLE II. INFLUENCE OF FERTILIZERS ON YIELD. (Johnston Orchard, Experiment 338).

(Total yields of fruit on each plot and annual yield per acre.)

Plot	1 Check	2 N. P.	3 N. K.	4 Check	5 P. K.	6 N. P. K.	7 Check	8 Manure	9 Lime	10 Check
Yr.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
1908,	90	528	237	446	57	759	211	278	558	106
1909,	675	6018	5257	1932	3089	6621	2008	3531	1216	1266
1910,	2575	3265	1822	3168	3552	2108	1629	6149	3185	3505
1911,	283	7563	7816	617	1227	8209	1362	4874	388	106
3 yr. totals,	3533	16846	14895	5717	7868	16938	4999	14554	4789	4877
Bushels per acre,	141.3	673.8	595.8	228.6	314.7	677.5	200.	582.1	191.5	195.

TABLE III. EFFECT OF FERTILIZERS ON YIELD. (Johnston Orchard).

(Average returns from certain treatments during past 3 years.)

Treatment	Checks (Av. 1, 4, 7, 10)	Manure (Plot 8)	N-Fertilizer (Av. 2, 3, 6)	P. K.-Fertilizer (Plot 5)
Totals 3 yr.,	4781 ℔.	14554 ℔.	16226 ℔.	7868 ℔.
Ratios,	100	304.4	339.4	164.5
	----------	100	111.5—	----------
Av. An. Yield per A.,	191.2 bu.	582 bu.	649 bu.	314.7 bu.
Av. Gain per A.,	----------	390 bu.	457 bu.	123. bu.

These tables are from one of our "combination" experiments, involving both fertilization and cultural methods, and started in 1908. The fertilizers have, therefore, had a chance to affect the crop only during the past 3 years, and it is for that period that the totals and annual yields per acre are computed.

Even a glance at these tables can leave no doubt as to the positive and profound effect of *proper* fertilization on the yield of apples. It will be noted that the checks run fairly uniform, averaging a little over 190 bushels per acre annually. Lime applications (at the annual rate of 1,000 ℔. per acre) have given almost exactly the same returns as the average check. The phosphate and potash combination has affected yield in this case rather decidedly, having raised it by 123 bushels per acre. This may be partly due to a slight superiority in location, as indicated by the fact that its adjacent check is the highest in yield and is within 88 bushels of the phosphate-potash treatment. While this increase in yield is fairly satisfactory, there is nothing in the growth or appearance of the trees of Plot 5 that would leave one to believe that their treatment is appreciably superior to that of the checks. In other words, the trees of Plot 5 still look starved and indicate that there is something else lacking, although it will be noted that this is the fertilization ordinarily recommended for orchards.

This lack is very decidedly met by the manure treatment of Plot 8. In this plot, the trees are making a luxuriant growth, both in wood and foliage, and the yields have been increased by 390 bushels per acre annually,—a very satisfactory exchange for 12 tons of stable manure. Even this increase in yield, however, is considerably less than those obtained on the plots receiving a nitrogen-carrying fertilizer. Under the latter treatment on three plots, the *average annual yield* has been increased from 191 bushels on the checks to 649 bushels on the fertilized plots, or an annual *increase* of 457 bushels of apples per acre. This resulted from fertilizer applications that actually cost less than $17, and the essentials of which can be bought at retail for about $10 per acre. During the past year, the fourth year of the experiment, as shown in Table II, the yield on Plots 2 and 3, compared with that of their adjacent checks, was at the rate of 17 to 1, the yield on the checks being at the rate of 54 bushels per acre, while that on the intervening nitrogen plots was 922 bushels. Surely it is not necessary to further defend the proposition that proper fertilization may very profoundly affect the yield of apples.

There is no reasonable possibility of these results being due to any other agent than the fertilizers. The trees are all of the same variety and same age. They receive the same spraying, pruning, soil handling and other care. The soil is practically level and very uniform. The treatments are abundantly checked. In fruit, foliage, growth and general health of trees, the benefits stop abruptly where the fertilizers stop, and similar results are being obtained by the owner in other parts of the orchard, on the same and other varieties, with the combinations of fertilizers found effective in the experiment.

In regard to the relative values of the different fertilizer elements, it will be seen in Table II, that nitrogen is evidently the first limiter. Thus, the phosphate and potash combination in Plot 5 has given an increase of 123 bushels per acre, while by the addition of nitrogen to this combination, in the adjacent Plot 6, we get an increase of 486 bushels. In other words, the addition of nitrogen to the treatment ordinarily advised for orchards, resulted here in nearly quadrupling the benefit. In Plot 3, where the phosphates are omitted, it will also be noted that there is an annual deficit which amounts to nearly 80 bushels per acre. This doubtless indicates that phosphorus is the second limiter and that the yield in Plot 3 is being reduced by lack of this element. Potash applications, on the other hand, have been of practically no avail in this experiment. This may be seen by comparing Plots 2 and 6. The annual addition of 150 ℔. of actual K_2O in the latter treatment has resulted in a gain of only 3.7 bushels of apples.

The above results were obtained without any aid from tillage or cover-crops, the fertilizers being merely sowed over the surface of untilled soil, on which there was a light sod composed chiefly of mixed grasses. Here the question may be raised as to whether equal or superior benefits may not have been obtainable with some form of cultural methods. This question is answered in Table IV.

TABLE IV. CULTURAL METHODS AND FERTILIZERS ON YIELDS
(Johnston Orchard.)

Plot Treatment	XIII Sod	XII Sod Mulch	XI Tillage & Cover Crop	(Av. 2 & 6) N-P-Fertilizer
	℔.	℔.	℔.	℔.
1908,	1170	2265	2843	2813
1909,	17982	7455	10702	27649
1910,	2940	16789	17254	11752
1911.	3550	2629	7500	34502
Totals last 3 yr.,	24472	26873	35456	73903
Ratios,	100.	109.8	144.8	302.
Ratios,		100	131.9	275.
Ratios,			100.	208.4
Av. An. Yield per A., 3 yr.,	223.7 bu.	245.7 bu.	324.1 bu.	675.7 bu.
Av. Gain per A.,		22. bu.	100. bu.	452. bu.

In this portion of the experiment, which is devoted to cultural methods, the plots are larger and contain 35 trees each. The yields of Plots 2 and 6, from the fertilizer portion, therefore, are raised to their corresponding values for plots of equivalent size. No fertilizers were used on the cultural methods plots, until the season just past. They were used then uniformly on all treatments, primarily because the sod plot had gone two years with very little fruit, though all the trees of these plots were plainly in need of something additional.

In Table IV, the sod plot shows a little higher annual yield than the average of the checks in the fertilizer portion, this being due to an exceptional crop that occurred on this plot in 1909, and from which the plot has not yet recovered. In the next plot, we see the effect of adding a mulch to the sod treatment. In this case, although all the herbage that grows is left in the orchard, and a further application of 3 tons of straw per acre is added to the plot, the average annual gain is only 22 bushels per acre. In the next plot, we find that tillage and leguminous cover crops have given a fair increase, amounting to 100 bushels per acre on the average. This, however, is hardly to be compared with the 452-bushel increase shown in the next case, which is obtained without tillage of any kind, merely by the addition of a fertilizer that carries the elements that are evidently lacking.

In some quarters one would gather the impression that apples can scarcely be grown without tillage. While we have nothing against proper tillage as an orchard treatment, yet this and other results from our experiments show that it is by no means indispensable in the production of first grade apples and that it can be readily over-emphasized like anything else. There are many situations that are otherwise very well suited for apples, where tillage is decidely inadvisable, and where, with proper management, the trees would get along very much better without it. In such situations it is undoubtedly preferable to sow the orchard down to some leguminous crop as a permanent cover and follow the mulch system, properly supplementing it with fertilization. For this purpose, hairy vetch is doubtless preferable, on account of its relatively low moisture draft, and its usually excellent staying powers when once well seeded down. Whenever it is crowded out by the grasses, the orchard may be re-plowed and again sowed to vetch, if the trees seem to require it.

DATA ON FERTILIZERS FROM OTHER EXPERIMENTS

Thus far we have confined our attention to a single experiment, primarily because the contrasts in it are so great that both the existence and nature of the effects could scarcely fail to be recognized. To go through each experiment in this way would be impossible in our present space, hence we have condensed into the next two tables a statement derived from the results of six experiments, including the one just discussed. These tables show the average effects of the different fertilizer elements, obtained in six experiments, during periods covering from three to five years as indicated. The effects are calculated as closely as possible and are expressed in terms of per cents. of benefit based on the normal performance of the treated plots. The methods followed in making the calculations are described briefly in our Bulletin 100 from the Pennsylvania Station, and described in full in our Annual Report for 1910-11.

TABLE V. EFFECT OF FERTILIZER ELEMENTS ON YIELD, COLOR, SIZE AND GROWTH

(Calculated Per cents of Benefit.)

Expts. 336, 338 & 339	Yield		Color—1909-11.	Size—1909-11	Growth—1908-11
	1908-11	1911			
	%	%	%	%	%
Nitrates in combination,	94.05	163.1	—13.3	—4.81	24.11
Phosphates in combination,	36.65	35.8	— .95	4.04	—3.97
Potash in combination,	—4.65	—6.42	— .1	13.2	4.17
Complete fertilizer,	122.5	166.4	—16.0	5.93	27.50
Manure,	144.1	169.8	—14.3	30.8	37.49
Lime alone,	19.5	—3.07	— 2.9	19.4	8.04

TABLE VI. FERTILIZER ELEMENTS ON YIELD, COLOR, SIZE AND GROWTH

(Calculated Per cents. of Benefit.)

Expts. 215, 216 & 220	Yield		Color—1908-11	Size—1908-11	Growth 1907-11
	1908-11	1911			
	%	%	%	%	%
Nitrates in combination,	41.7	18.05	—12.35	—1.67	14.83
Nitrates alone,	30.0	39.10	—16.00	—6.23	18.33
Phosphates in combination,	15.4	9.35	— 1.55	.925	.62
Phosphates alone,	— 7.4	—7.37	2.80	—1.21	.52
"Floats" alone,	—18.8	6.4	7.70	—1.92	—6.00
Potash in combination,	15.2	12.80	6.55	5.67	2.71
Complete fertilizer,	68.8	65.7	—16.00	4.30	19.10
Manure,	101.-	221.90	— 9.90	4.73	24.70
Lime alone,	—12.0	15.1-	.8	—1.05	3.1

In general, these tables corroborate and extend the deductions obtained from those already considered. The addition of the results from the other experiments have reduced the apparent benefits somewhat and the relative values of certain materials are also slightly changed. We have included the results of the first year in the yields of Table V, which also reduces the apparent benefits, since the fertilizers had not yet had time to operate. Even at that, however, we see that the yields during the 4-year period have been nearly doubled by the addition of nitrates, in experiments 336, 338 and 339 and with the same material they have been increased by 41 per cent. in the younger experiments of Table VI.

Phosphates, when used in combination with nitrogen or in a complete fertilizer, maintain their position as the next limiter after nitrogen, though they are closely pressed by potash in Table VI. On the other hand, neither acid phosphates nor "floats" nor lime, when used alone, have shown any consistent benefits on yield thus far. Their apparently *negative* influences on yield may be smoothed out in time, as indicated by some of the results of the past year. There is some evidence, however, that certain of these negatives really indicate a toxic action that is manifested only under certain conditions, but we have not yet carried this far enough for definite statements.

The important advantage shown by manure, especially in Table VI, is doubtless largely due to the very full crops on the manure plots of those experiments during the past year, which was rather of an off year for the similar plots receiving complete fertilizer. The better moisture-conservation under the manure and the larger amounts of plant food carried in it also probably account for a part of the superiority. In general, however, we do not find any important superiority in manure over a proper commercial fertilizer, neither in actual or net increases. Manure is undoubtedly a safe and valuable material to apply in orchards, when it can be satisfactorily obtained in sufficient amounts. But with very few exceptions, thus far in our experiments as a whole, wherever manure has given important increases, these increases have been approached or surpassed by a proper commercial fertilizer.

CORRELATION BETWEEN YIELD AND GROWTH

In regard to growth, it will be observed that, in general, the improvements in it have accompanied those in yield. The same materials that have improved the one have generally improved the other. In other words, as a rule, our best growing plots have been our best fruiting plots. Contrary to a prevalent notion, therefore, we may say that growth and fruiting are not necessarily antagonistic, but rather are associated, unless either should occur in abnormal amount.

DATA AND DEDUCTIONS ON COLOR

In regard to color, it will be observed in Tables V and VI, that none of the applications have given any important increases, and most of them have given decreases. Similar results have also been uniformly obtained elsewhere, so far as we have received the reports. The same is essentially true of applications of iron salts. From these and other considerations, therefore, we believe that color in apples can not be materially *improved* by soil applications, and that it is *primarily dependent on maturity and sunlight.*

This refers only to the red colors in apples. The yellow colors can probably not be affected by any external agency. Physiologically, the yellow color is connected with certain bodies located in the superficial layers of cells in the apple skin. It develops independent of light, and its intensity depends merely upon the degree of maturity or ripeness. The red color, on the other hand, is a constiuent of the cell sap; it is capable of being influenced by a number of agencies; and its intensity is dependent primarily upon the amount of light received during the latter stages of maturity. In other words, we get back to its dependence upon maturity and sunlight. Conditions increasing one or both of these factors, such as late picking, light soils, open pruning, and sod culture will increase color. Opposite conditions decrease it.

From this viewpoint, the reduction in color caused by the nitrates and the manure is easily explained. It is evidently due to delayed maturity. That such is the case was shown the past season, especially in the Johnston orchard, where the fruit of the nitrogen plots was left on the trees until it reached approximately the same stage of maturity as that on the checks when they had been picked. The difference in the dates of picking, which corresponded closely with the delay in maturity, was exactly 3 weeks—from September 28 to October 19. And when the final picking was done, the amount and brightness of the color on the nitrate plots was actually greater than it had been on the checks. The average increase in color on the treated plots, 2, 3 and 6, over the checks, 1, 4 and 7, was actually as great as 10.3 per cent. The great importance of maturity on the trees in increasing color is thus clearly shown.

The importance of sunlight, we had already determined in an earlier experiment. In it, we found that after the apples were picked, exposure to sunlight increased their redness by 35 per cent, while the checks in the dark and those exposed to electric light showed no definite increase.

We may also mention the facts that color may be materially affected by certain kinds of spraying and by internal variations such as appear in the solid-colored variants from the Gravenstein and 20-ounce. These points also are discussed in our Annual Report for 1910-11, but space is too limited for further consideration here.

RELATION OF FERTILIZATION TO SIZES

Again referring to Tables V and VI, we see that nitrates have apparently reduced the average size of the fruit. Phosphates have given only a slight benefit, if any; while potash and manure have given quite important increases. This apparent benefit from potash is interesting, and it may indicate an actual fact, since size depends upon moisture and potash has been credited physiologically with the ability of increasing the osmotic power of plant cells.

All these apparent influences on fruit-size, however, must be considered in their relation to the size of the crop on the trees. A year ago, we plotted a number of curves from data given in connection with a fertilizer experiment at the New Jersey Station, in order to determine definitely, if possible, whether any relation existed between these two factors,—fruit-size and size of the crop on the tree. We found that no correlation exists below what we may call a certain critical point, and that, under the New Jersey conditions, the number of fruits on even moderate-sized trees had to exceed about 1,400 per tree before any perceptible correlation appeared. *Above this critical point,* however, it is probable that *crop-size is the dormant influence on the size of the fruit,* though the exact position of the critical point may doubtless be raised or lowered somewhat by local conditions of moisture, plant food, etc.

In our judgment, this has a bearing upon the fact that nitrogen has apparently failed to increase the size of the fruit in our experiments. The crop-size was raised so much that full size of the fruit was not obtainable.

It also has an important bearing upon thinning. It means, in general, that if one thins an apple tree of even moderate size before the number of fruits has reached a critical point, which may be 1,400 or more, he can hardly expect to modify the size of the remaining fruit, and the most effect of the thinning will be an actual reduction in total weight of apples at least for that year. Exceptions to this may appear in varieties of extra large size, or in seasons or locations that are exceptionally dry.

It also means that, below the critical or the thinning point, there is opportunity for the other factors to exert their influence. It is here that such factors as fertilizers, cultural methods, moisture-supply, and heredity show their effects, and they may co-operate in such a way to materially raise the critical point. This assumes that the variety is properly located in respect to temperature and length of growing season, both of which are factors that may have an influence on fruit-size. We also may mention here the factors of pollination and number of seeds per fruit, which have been found to affect fruit-size by Ewert and Müller-Thurgau in Germany.

SUGGESTIONS ON THE USE OF FERTILIZERS IN ORCHARDS

The foregoing discussion does not mean that all fertilizers or all orchards will give a profitable response to fertilization. There are too many other limiters for that. Some of our experiments and some treatments have given no important results as yet. This may be due to improper moisture supply, relative youth of some of the trees, or to the action of some other one or more of the many possible limiters.

All the facts, therefore, emphasize the necessity for local or community trials. It is unsafe for the grower to assume either that all orchards need fertilizers or that no ochards need them. Either of these attitudes, if consistently acted upon, is almost sure to prove costly to its possessor. The only safe attitude is the one that views the orchard like other crops, knowing that lack of available food is undoubtedly the limited at times, and using proper fertilization extensively only where and when it is needed.

As to what constitutes a proper fertilizer, on the basis of present results, we are suggesting a combination that will carry about 30 pounds actual nitrogen, 50 pounds of actual phosphoric acid (P_2O_5) and about 25 pounds of actual potash (K_2O) per acre. Where there is evidence that potash is needed, the above amount may be increased to 50 pounds of K_2O. The former amounts are carried in 500 pounds of a 6-10-5 fertilizer, and the latter are given by the same weight of a 6-10-10 material. We apply the nitrogen by using 100 pounds of nitrate of soda and 150 pounds of dried blood, thus getting quick action and also one that is prolonged well through the season. The phosphates may be carried in 200 pounds of steamed bone meal or raw rock phosphates; or in about 350 pounds of acid phosphate or basic slag. The potash may be carried in 50 or 100 pounds of muriate or high-grade sulphate, depending upon which of the formulas is desired, or in 100 or 200 pounds of low-grade sulphtae. Upon the relative values of these latter carriers, we have very little evidences as yet.

The above amounts are intended as annual applications for bearing trees of medium age where most of the ground is to be covered. For younger trees, they may profitably be reduced, approximately in proportion to the amount of soil to be covered. On older trees or in special conditions, the combination is expected to be varied as later results direct. For example. in some instances, especially in connection with sod, we have found that the amount of nitrogen is apparently a little too low, while with tillage and leguminous cover-crops it is likely to be somewhat higher than necessary.

As to where fertilization is needed, this is more difficult to define. and probably the only certain method of determining it is by actual trial. These trials are very simple. Merely leave a typical portion of the orchard untreated, for three or more seasons, as a check on the value of treatment, and carefully mark and record the trees in at least one of the groups. There are a number of points, however, that will aid one in determining the relative size to make these groups, or in other words, aid in deciding whether to leave most of the orchard in the check or in the treated portion.

In general, for two years at least, the check should be much the larger in most young orchards or in any orchard that is doing well through late August and September. The fact that the trees are well loaded in a given year, however, is no sufficient reason for omitting the fertilizer that year. In fact, that is one of the best reasons and times for applying a proper fertilizer rather liberally, in order to prevent the total absence of a crop the following year and in the long run tend to steady the annual production.

In case of the reverse conditions—old orchards or those not retaining a thrifty look throughout the season or not growing and bearing regularly and satisfactorily—it is best to reverse the procedure and fertilize most of the orchard, leaving only a small block as a check. In all cases. however, we strongly advise the use of a check until the real value of the treatment is thoroughly established. Even then it is not desirable to omit either the check or the treatment entirely. The less valuable one may be reduced to a small space. but it should not be omitted entirely if the grower cares much for his orchard. One of our experiments. for example, showed practically no response until the fifth year, and then. when the cropping strain began to appear. quite marked differences arose in favor of the properly fertilized plots.

The time of application we also consider important. especially in the case of the nitrates. While our evidence is by no means complete on this point, yet we have some indications that nitrates applied too early in the season may be wholly lost to the trees. Other evidence leads us to believe that distinct harm may be done by making nitrate applications too near the fruit-setting time. especially in the case of peaches. We feel. therefore. that nitrates should be applied not earlier than petal-fall in apples, and probably not later than the first of July, though we have had some very good results from applications made as late as July 8. Making the applications within this period also permits one to vary the amount applied somewhat in accordance with the amount of fruit set on the trees.

With the less soluble and slower acting minerals, the application time is less important. We know some careful observers, who regularly apply their phosphates and potash in the fall on peaches and claim that this gives the best results. Thus far we have felt that the time of application for the minerals is of relatively little importance, since they are rather quickly fixed in the soil, in any case, and they do not leach readily. We therefore apply them along with the ntirogen, at the time that we consider best for it.

The method of application that we have followed is merely to scatter the fertilizers broadcast over the surface of the ground, taking care not to get it too close to the tree trunk, where there are few absorbent roots, and extending the applications well out beyond the spread of the branches. This may either be left on the surface to be washed in by the rains or it may be lightly harrowed or plowed into the soil. With this all done, it is well to remember that the fertilizer applied in any given season can hardly affect materially the yield of that year, since the fruit buds are formed in the latter part of the preceding season. Important results, therefore, should not be expected before the following season at the earliest, and, as stated above, they may not appear until considerably later and still prove of value.

The CHAIRMAN: We now have fifteen minutes for the discussion of these valuable papers. What is your pleasure? Shall we take them up as they appear on the program, or take this particular one up? Shall we take up the paper on Fruit Culture, Road-making or Cereals? Has any one anything to say on these subjects? If so, you have the floor now. We would like you to talk to the point. We have only a few minutes for discussion. Are there any questions you want to ask Prof. Stewart in regard to these charts?

MR. MARTIN: I would like to ask the Professor if he has taken any notice of the liability of trees to be infested by insects and fungus diseases, whether they would be more exempt or more likely to be attacked?

The CHAIRMAN: The Professor has just gone out. I understand he wants to make a train. We will now take up the road question. Has any one any questions to ask Mr. Weller?

PROF. SURFACE: I should like to say a word in answer to Mr. Martin's question. I consider this to be one of the most important questions and I will therefore—Oh! I see Prof. Stewart is coming in and will let him answer it.

The CHAIRMAN: Will Mr. Martin please repeat his questions?

MR. MARTIN: Trees that have been treated, are they more resistant or more liable to insects and fungus diseases than the trees that have not been treated?

PROF. STEWART: The probabilities are that the fertilizer has no connection so far as insects are concerned. We do find, however, certain connections between certain fertilizer applications and fungus diseases. For instance, this "Frog Eye" fungus that attacks the foliage in a number of cases, we have found that it helps to overcome the tendency of "Frog Eye" to defoliage the trees. It checks it, and there is enough green matter there to overcome it. Also we have observed a certain corelation between certain applications and the fruit pit which makes the brown punky spots on the fruit. We think we have had this year some rather interesting corelations between applications of manure and that. It seems to be more where the manure was, than where it was not.

MR. MARTIN: Are they more or less resistant to disease?

PROF. STEWART: They are certainly more resistant, except that in certain instances, manure seems to increase the disease. In certain cases of blister mite, they have the same relation as in the "Frog Eye," but in the case of the codling moth and things like that they are just the same as the San Jose scale. Of course the probabilities are that the tree will last longer with the fertilizer application than without them.

PROF. SURFACE: What in regard to the blight? Is it stimulated by the fertilizer—the fire blight?

PROF. STEWART: Yes, there is a pretty close relation there, but it is not perfect. We find in some of our relations decidely more blight in the manure applications, but we must remember that under these treatments increase of growth is stimulated with the mulch and manure. This has been done in Bedford county, in Mr. Flick's orchard, in Franklin county, in Mr. Wertz's, and in some others. There seemed to be more blight after the treatment. Of course, the workmen are always liable to exaggerate more or less, but they said there was more blight in that spot than in all the rest of the orchard. It would, however, be safe to say that there was a decided relation between the two; that the weak tree is also quite subject to fire blight. I have seen weak trees almost killed by blight, where strong ones were not touched. It is the steady, slow growth on the middle ground that is resistant to blight.

MR. FENSTERMAKER: What about the blight or brown spot on the Baldwin? How do you find it there with the mulch treatment?

PROF. STEWART: Well, as I say, the only distinct relation that I have observed has been the increase that followed the application of manure in certain experiments. I do not think there is any other fertilizer treatment in which the similarity occurs, although this is a point at which we have not aimed our observations as completely as we should. I started it four years ago but gave it up the end of the second year, because I did not see any corelation, and there are so many things to take up the interest of the fruit grower. At that time, too, Brooks had just come out with his statement that this was due to a fungus growth which was one of the very reasons I abandoned it.

MR. RODGERS: Are we to understand then that the manure causes more blight, and more brown spots than if it had not been put on?

PROF. STEWART: That is practically the case. It does not do it in the case of other treatments, but the manure seems to cause blight.

MR. MARTIN: Professor, might it not be that when the manure is applied it makes a more vigorous growth, and that that growth is more susceptible to blight than any other tree?

PROF. STEWART: Oh, yes, that is a fact, but you take a tree and feed it right, at the end of five years you will find it better than a tree that has not been fed properly.

DR. BECK: Then you think cultivation is not desirable in an orchard?

PROF. STEWART: It is of the utmost importance. But so many things enter in that it is impossible to touch them all in so short a time. I would not say that cultivation is absolutely necessary in all orchards, but there are orchards where it is proper. It is not, however, absolutely indispensable on the average orchard, because there are other ways in which you can conserve moisture and get plant food, which are the two things cultivation does. It is, therefore, of actual plant food value, as well as a moisture conservor, but you see orchards where it is better to get it from mulch; so that either matter is right in its place. In an orchard where it is all right and you prefer it, it is all right to cultivate, but you do not have to cultivate an apple orchard in order to get good returns. In other words we got four and a half times as great returns from the mulch as from the cultivation, taking it on a three year average.

MR. HOLMAN: Would you recommend it in case of a peach orchard?

PROF. STEWART: We have not tried this beyond the second year, and while we think it would be successful, I would not want to say so. Individually, there are cases where manure would not do at all in a peach orchard, and again there are cases where it would be the proper thing. It is a local matter and I would not advise a man to put manure all over his orchard until he has tried it locally. In the Niagara County Survey in New York, we find there was on an average 5,000 acres of peaches, and while I have forgotten the exact figures, on a guess I would say that about $30.00 per acre more was obtained from the use of manure than from any other fertilizer, while the average increase of the treated orchards was something like $46.00. However, it comes back to this point; I would not put manure on a peach orchard until I had tried it thoroughly on a small plot to see what it would do.

A Member: Would you recommend the cultivation of any orchard on a heavy limestone center?

PROF. STEWART: If you have no mulch, I believe I would sow it upon hairy vetch. Up at the College we have an orchard on heavy limestone soil, which we have sown in hairy vetch and it gives us good results.

PROF. SURFACE: What time do you sow the vetch?

PROF. STEWART: I do not believe it makes much difference, about the first or middle of July, if you precede it by cultivation; if you don't want to precede it by so much cultivation, I would say that you should sow it at any time that is good for the vetch.

PROF. SURFACE: May I ask, the brown spots on the Baldwin and Jonathan that produce the pit, are they increased by this treatment?

PROF. STEWART: Do you refer to the superficial or the interior form?

PROF. SURFACE: The puky pitting on the skin, showing in small black spots. It has not yet attacked the York Imperial so far as I know, but it shows freely in the Baldwin and Jonathan.

PROF. STEWART: Brooks, calls it the "Black Spot," and I follow his name. It produces sort of an interior punkiness, as well as attacking the skin.

It appears to be a physiological disturbance, although so far, we have not been able to throw much light on it, except the feature I have just mentioned, of the possible corelation between it and the manure applications. It seems to be due to an irregularity of the moisture supply, although I am not sure of this second point.

A Member: Is this more general on a moist soil?

PROF. STEWART: I believe you are right; and for that reason we know it to be physiological, and in some measure due to an irregular supply of moisture. Your statement is that it is more prevalent in a moist situation?

A. Member: I have a Baldwin tree right by a spring which is very badly infested; beyond it, about a hundred feet away and higher up, the trees are not affected.

The CHAIRMAN: This is an interesting subject, but the hour of noon has arrived and some of these farmers are making faces at me, showing they are hungry. If it is your pleasure we will now stand adjourned until 1.30 this afternoon.

Harrisburg, Pa., January 24, 1912, 1.30 P. M.

Mr. Hutchison in the Chair.

The CHAIRMAN: You will now please come to order. Secretary Critchfield is detained at his office for a short time, but we have three Vice-Presidents. Mr. Kahler will preside for a short time and then Mr. Gearhart will take the Chair.

Mr. Kahler took the Chair.

The CHAIRMAN: We will proceed with the consideration of the Reports of Specialists of the Board. The first number is the Report of the Botanist, Prof. Buckhout of State College.

The SECRETARY: The report is here but Prof. Buckhout is unable to be with us.

The CHAIRMAN: What shall be done with the report?

MR. HUTCHISON: I move it be received and published with the proceedings.

This motion was properly seconded and duly carried in the regular way.

Prof. Buckhout's report is as follows:

REPORT OF THE BOTANIST

By PROF. W. A. BUCKHOUT, *State College, Pa.*

The correspondence during the past year has been along the usual lines and has presented but little out of the ordinary. The practical botanical questions which interest the people are chiefly seed and plant determinations and weed eradication. In the latter matter one can simply reiterate that there is ordinarily no quick, shorthand way of getting thoroughly rid of pestiferous weeds. It is simply a question of common sense methods of cultivation and general handling of the land concerned. Many are unable or unwilling to do this: hence the frequent appeal for advice.

I would again call attention to the excellent series of Farmers' Bulletins issued gratuitously by the Department of Agriculture, Washington, D. C., among which are the following which every one interested in weed destruction should procure. No. 28, "Weeds and How to Kill Them;" No. 279, "A Method of Eradicating Johnson Grass;" No. 368, "The Eradication of Bindweed or Wild Morning Glory;" No. 464, "The Eradication of Quack Grass." No spoken or written directions can take the place of these excellent bulletins.

A good illustration of the importance of correct and exact determination of seeds came to my attention by a sample of Catalpa seed, with the inquiry whether this was the seed of the Catalpa species most valuable for forestry purposes. There are three species of Catalpa now in common use. Catalpa speciosa, the most desirable, bignonioides, less so, and Kempferi, a small Japanese tree useful only in ornamental planting. The seeds in all three are of the same general type, but varying in size and different minor points readily detectible by one who has studied them. Since forest trees are even longer in proving their exactness of kind than are fruit trees it follows that one should be careful from the start, lest he find years afterward that he has used seed of the wrong kind. In this instance the seed was true to name and would produce the larger, straighter and longer-lived forest tree which was desired.

Inquiries regarding special crops, particularly ginseng have become so frequent that a brief circular on this latter species has been prepared. Since it expresses the essential things to be borne in mind by those who are inclined to undertake ginseng cultivation it is embodied herewith:

GINSENG AND ITS CULTIVATION

Ginseng is a native American plant, growing wild over the eastern United States and Canada, preferably in rich, loamy soil and in woodlands throughout the Allegheny region and the northern states west of Minnesota and Missouri. It is one of about seven species native of the district above mentioned and eastern Asia.

It is an herbaceous perennial, low growing and reaching maturity only after several years of growth. It has characteristic five parted leaves, quite distinct from any other species. One familiar by practice can readily distinguish it from wild sarsaparilla or other plants commonly associated with it. The stem is insignificant and scarcely noticeable, except when bearing the cluster of bright red berries which follow the small flowers. In the fall, leaves and stems disappear, except that a short basal stem bearing one or two buds persists just beneath the surface capping the small tap root. The plant grows slowly. At the end of the third year the root, if favorably placed, may be as large as one's finger, not unlike a small parsnip, but less symmetrical and generally quite irregular and branching. This root is the usable part of the plant. It is commonly gathered for sale when several years old. The bulk of the roots of commerce are five or more years old. Collection of the wild roots which when dried meet with ready sale has long been common in the hardwood districts where the wild plants are most abundant. The high prices obtained and the fascination of hunting it have combined to diminish the natural supply and to threaten the extinction of the plant.

As explaining the great demand for ginseng roots it may be said that they have no medicinial value whatever in the estimate of American or European authorities, but from time immemorial the Chinese have held them in the highest repute and are willing to pay fabulous prices for them. For some years the export of American roots to China has been approximately 150,000 pounds per year and formerly it much exceeded this. Apparently the natural supply is being exhausted, hence the cultivation of the plant has attracted attention and much of the root now handled is thus derived. The experience of the last few years has shown that there is no inherent reason why its cultivation may not be successfully done; whether profitably is another question. There are two ways of starting a ginseng bed: by seeds, and two year old roots. In raising plants from seeds it should be noted that the seeds lose vitality very quickly on drying. Hence so soon as they are gathered they should be stratified in leaf mold. Mix the seeds with four times their bulk of leaf mold or make alternate layers of leaf mold and seeds in a wooden box, and leave out of doors over winter in some protected place. These seeds should not be disturbed until the spring of the second year, since but few seeds will germinate before they are eighteen months old. Of course seeds may be planted as soon as they are gathered, as nature does, but the risk of loss during the dormant season is very great. Beds are more generally made by planting two year old roots. These are dibbled in like any other trans-plants and may be placed only a few inches apart. It goes without saying that whether seeds or roots are used the bed should be most carefully prepared. No success need be expected unless this is rigidly attended to. The after care must be entirely by hand-weeding and working, and presents no peculiarities worthy of special mention. Ginseng is so nearly a wild plant that careful attention to the conditions under which it naturally grows is quite necessary. It has been found that it is essential to make beds in partial shade either of surrounding large trees or of artificial frames. For obvious reasons the latter method is most feasible. A light screen of lath so as to give about one-half light is most suitable. This may be placed close to the ground or supported upon posts high enough to enable one to work under it easily. The latter is much preferable. A fence tight enough to exclude dogs, cats and domestic fowls is practically a necessity.

All these features together with the relatively high cost of the seeds or roots put ginseng in a class by itself, and make it absurd to talk about it as one would of ordinary farm and garden crops.

While, as stated, there are no inherent reasons why ginseng may not be successfully cultivated it is none the less true that there are special difficulties and diseases which must be reckoned with. The former have been, perhaps, sufficiently indicated already, the latter become more and more marked with time. This is true of all sorts of plants, none are likely to long remain immune. The principal diseases of ginseng are: (1) The wilt of old plants. This is of the same general character as the wilt of cotton, melons and other garden plants. The name expresses the character of the disease very well. (2) Wilt of seedlings. This is of the same general nature as to results, but affects the young and delicate seedlings, often spoken of as the "damping off" of seedlings. There are several causes of this malady. There is but little, if any, remedial treatment for these diseases short of starting cultivation anew with clean stock in clean soil. (3) Black rot, Soft rot, and Leaf spot fungus are likewise not seldom met with, and are difficult to control or correct. (4) Worms and insects are sometimes serious pests. The roots often show galls looking like beads on a necklace. This is caused by multitudes of small worms particularly liable to occur in rich soils. Snails and a stem boring insect larva sometimes do serious injury.

Enough has been said to show that the cultivation of this plant, while entirely feasible, is accompanied by the same class of difficulties as are the more common plants of cultivation, and is moreover of a highly special character, requiring both a special knowledge of the nature and habit of the plant itself, and, also, a most careful attention to detail methods of treatment not generally called for. Any one who desires to grow ginseng should spare no pains to inform himself thoroughly on all these points. If possible he should visit some grower and study the plant and its treatment, as well as get the owner's experience. In default of ability to do this he should get some of the publications on the subject. The Orange Judd Co., 429 Lafayette street, New York, publish a small book for fifty cents. The various dealers and companies issue attractive and highly seductive circulars setting forth the ease of cultivation and the certainty of reaping enormous profits. A large part of the money made in ginseng comes from the sale of seeds and roots to novices who are tempted to try its cultivation. If they do not well understand the fundamental features which this paper has outlined they are doomed to disappointment and failure. The Bulletins of the U. S. Department of Agriculture and the State Experiment Stations are generally out of print, but may be found in General and Annual Reports. Two of these should be available in various public and private libraries in Pennsylvania. It is strongly advised that they be consulted. No copies are available for distribution by the Station.

(1). Report. Pennsylvania State College, 1902-3. Page 185. "An Experiment in Ginseng Cultivation."

(2). Report Department of Agriculture, Pennsylvania. Part I. 1897. Page 617. "The Cultivation of American Ginseng in Pennsylvania."

The CHAIRMAN: The next is the Report of Dr. Frear, the State Chemist.

The SECRETARY: Dr. Frear was in the city this morning but I think he told me that he might be called away, and in that event he would see that the report got into my hands. I therefore make a motion that it will be received and published in the journal of the proceedings, with the understanding that if Dr. Frear should come in he should be called upon to read his lecture.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: Next in order is the paper by Mr. J. Aldus Herr, of Lancaster, on "The Practical Side of Local Organization in Agriculture."

MR. HUTCHISON: Mr. Herr is in the city but is not in the room at present.

The CHAIRMAN: This about completes the program for this afternoon.

The SECRETARY: I would suggest that Mr. Hutchison make his report now. There is a very good audience present.

MR. HUTCHISON: I will do the best I can to make a noise. Some of us spent several days last week in the City of Pittsburg, at the big Fruit and Livestock Show. It was great. But you all know what the weather was last week, and it has left a number of us with colds.

Mr. Hutchison's report is as follows:

REPORT OF SPECIALIST ON FEEDING STUFFS

By GEORGE G. HUTCHISON

To the Members of the State Board of Agriculture of Pennsylvania: As your consulting specialist on feeding stuffs, I beg leave to make the following report for 1911.

This has been a year of high prices for feeds in Pennsylvania. The one great reason was the drouth that passed over this State in the late spring and early summer, and in some sections, there was a great shrinkage in the corn and oats crops. Another reason was that in the West there were failures and a large amount of live stock was placed upon our markets and found buyers among our feeders and these had to be fed.

In regard to the law that was placed upon the statute books a few years ago, I beg leave to state that it has not been questioned on its constitutionality and in fact, we have only tried one case in court, the manufacturers and dealers having paid their fines before the Magistrate. The statement that I made in my report of last year, that all feeds should be sold on their protein and fat analysis and their low fibre constituents, or the higher the protein and fat and the lower the crude fibre, the more valuable the feed. This is the sermon the salesmen of the large feed concerns who are seeking our markets, preach in regard to their feeds, and if our feeders would study the tables furnished them, they could be just as well informed in regard to the composition and value of feeds as the salesman who sells the same.

To prove my contention, I will ask you to compare the analysis of a sample of gluten meal which analyzes as follows: Protein, 29.30%, fat, 11.30%, crude fibre, 3.30%. Sample of wheat middlings, protein, 15.60%, fat, 4.00%, crude fibre, 4.60%. Buckwheat middlings, protein, 28.90%, fat, 7.10%, crude fibre, 4.10%. Cottonseed meal, protein, 42.30%, fat, 13.10%, crude fibre, 5.60%. This is a sample in which there were no cottonseed hulls. Linseed meal, protein, 32.90%, fat, 7.10%, crude fibre, 8.90%. These are among the very high grade meals that are found on all our markets and are bought by all our feeders. These are some of the feeds that you should see that are pure and you should buy on this guarantee.

The feed question and the digestibility of feed is the one great question which our experimental stations should take up and work out for our farmers and feeders. The manufacturers and compounders of commercial feeding stuffs claim that a given amount of their feeds are digestible, but they do not give you any feeding test. What you gentlemen want is a test of these feeds on your horses for work and driving purposes, your cows for butter and milk and your other domestic animals for growth and fattening.

There are tables given of some reports, and we do not doubt their correctness, but the only true way is to feed a feed to a cow a given number of days and to keep a correct account of what she eats and what she produces in milk, if the feed is fed for milk, or if the feed is fed for butter. Give the amount she consumes and the amount she produces. This is the kind of table that will show in dollars and cents what the said feed will give in return for the money invested.

A new book on stock feeds and feedings has been published in the last year by Jas. E. Halligan, Chemist in charge of the Louisiana State Experiment Station, Baton Rouge, La., and published by the Chemical Publishing Co., of Easton, Pa. It is one of the latest and best books that has been published on this subject, and anyone who is interested in this great subject should secure this book and make a study of the question. You are the men who are paying the feed bills and you should take time to look into this question. I hereby give you a table of analysis of feeding stuffs and also the adulterants:

TABLE OF ANALYSIS

Name of Feeding Stuff	Crude Protein	Crude Fat	Crude Fiber
	Per cent.	Per cent.	Per cent.
Corn,	10.40	5.00	2.00
Hominy chop or feed,	9.80	8.30	2.80
Gluten meal,	29.30	14.30	3.30
Gluten feed,	24.00	10.60	5.30
Dried distillers' grain, largely from corn,	30.80	13.30	12.00
Oats,	11.80	5.00	9.50
Oats shorts,	16.00	7.10	6.10
Wheat,	11.90	2.10	1.80
Wheat bran,	15.40	4.00	9.00
Wheat middlings,	15.60	4.00	4.60
Wheat shorts,	14.90	4.50	7.40
Barley,	12.40	1.80	2.70
Barley meal,	10.50	2.20	6.50
Brewers' grain, dry,	26.00	5.60	1.40
Malt sprouts,	27.20	2.00	13.00
Rye,	10.60	1.70	1.70
Rye bran,	14.70	2.80	3.50
Buckwheat,	10.00	2.20	8.70
Buckwheat bran,	12.40	3.50	*31.90
Buckwheat middlings,	28.90	7.10	4.10
Buckwheat shorts,	27.10	7.60	8.30
Cottonseed,	18.40	19.90	23.20
Cottonseed meal,	42.30	13.10	†5.60
Flaxseed,	22.60	33.70	7.10
Linseed meal, O. P.,	32.90	7.90	8.90
Linseed meal, N. P.,	33.20	8.00	9.50
Corn silage,	1.07	0.80	6.00
Alfalfa hay meal,	14.3	2.20	25.33

*Note high per cent. †No hulls.

This table gives you the analysis of the cereals as nature produces them. It also gives you the analysis of the by-product as the chemists find them, and I hope that this table may aid you in becoming educated in regard to the feeds that go to make up the concentrated pure feeds that are on the market.

I am often asked the question, "What is the analysis of the adulterants that are mixed with the feeds that are found on our markets?"

I will give you a table of the adulterants that we have found on the markets of Pennsylvania:

Name of Adulterant	Crude Protein	Crude Fat	Crude Fiber
	Per cent.	Per cent.	Per cent.
Corn cobs, ground,	2.40	0.50	30–33
Oat hulls,	3.00	1.00	29.33
Buckwheat hulls,	4.60	1.10	43.30
Cottonseed hulls,	2.00	----------	40.00

The trade journals that are devoted to the sale of grains, flours and feeds are large advertisers of what is known as chicken wheat. This wheat is a very low grade, a large percentage of the grains are shriveled up, containing a very low percentage of starch and is almost worthless. They also buy a large amount of screenings which contain a large amount of weed seeds, but, as stated by me before in this paper, they are not selling the same in Pennsylvania, as the activity of the Department of Agriculture in enforcing the law has rid our markets of these worthless grains.

We have a large number of samples of feeding stuffs in our laboratory. I had hoped that we would be able to place our exhibit before you, but the winter fair which was held last week in Pittsburg had requested the Secretary to have this exhibit made there, and it has not been returned in time for us to make an exhibit here, but if you will call at the laboratory on the fifth floor of this building, the Chief Chemist or Assistant Chemists will gladly show you samples of feeding stuffs. Our exhibit at Pittsburg was visited by hundreds of people, and a large number of requests for Bulletin No. 208 were made. This bulletin was compiled by Mr. James W. Kellogg and great credit should be given him for the ability he has shown in this work. If it were possible for each farmer and stock feeder to have a copy of this bulletin on his table, he could be saved large sums of money in buying feeds. If you or your friends will send your names to Mr. Kellogg, he will place them on our mailing list and mail to you a copy of Bulletin No. 208. We now have a list of 6,000 names and this is increasing each year. The bulletin for the work done in the year 1911 is now being prepared and will be published in due time.

I herewith give you a table showing the work done by us in the visitation of the agents of the Department of Agriculture. You will see by this table, the agents visited a number of towns and did not obtain samples. The reason for this was that they had secured samples in neighboring towns of the same brand of feed. In 1910 we secured 1,500 samples, and in 1911, 1,000. The reason for this difference is last year our agents took a large number of samples of wheat bran and middlings. We found that the wheat brans and middlings were pure, and as the mixing of ground corn cobs with brans and middlings had ceased, and to save expense of analyzing, we have not drawn so many samples of bran and middlings. But we do not want you to think we are not taking samples of wheat bran and wheat middlings. We take a few of each manufacturer we find on the markets, and in this way, we keep a check on what is being sold in our Commonwealth:

TABULATED STATEMENT

ADAMS—	
Idaville,	1
ALLEGHENY—	
Pittsburg,	16
Tarentum,	2
Wilkinsburg,	8
Homestead,	1
McKeesport,	6
Carnegie,	6
Pitcairn,	3
Braddock,	8
E. Pittsburg,	1
Turtle Creek,	3
Wilmerding,	11
Duquesne,	0
	65
ARMSTRONG—	
Apollo,	4
Vandergrift,	3
Leechburg,	2
Kittanning,	8
Ford City,	0
Freeport,	0
Manorville,	0
	17
BEAVER—	
Beaver Falls,	5
New Brighton,	5
Beaver,	1
W. Bridgewater,	3
Monaca,	3
Freedom,	0
Rochester,	0
	17
BEDFORD—	
Hopewell,	3
Saxton,	3
Bedford,	2
Everett,	6
Hyndman,	0
Coaldale,	0
	14
BERKS—	
Topton,	1
Barto,	1
Kutztown,	1
Lyons,	1
Fleetwood,	2
Leesport,	2
Shoemakersville,	0
Hamburg,	1
Womelsdorf,	1
Robesonia,	1
Wernersville,	1
Shillington,	1
Mohnton,	1
Birdsboro,	0
Mertztown,	1
Bowers,	1
Shamrock,	0
Hancock,	1
	17
BLAIR—	
Altoona,	23
Tyrone,	5
Juniata,	2
Bellewood,	0
Duncanville,	0
Gaysport,	0
Hollidaysburg,	0
	30
BRADFORD—	
Troy,	8
Canton,	0
Alba,	0
Towanda,	0
Wysox,	3
Ulster,	1
New Albany,	2
Monroeton,	1
Sayre,	0
Athens,	0
Wyalusing,	1
	25
BUCKS—	
Doylestown,	14
Chalfont,	8
	22
BUTLER—	
Zelienople,	4
Butler,	9
Slippery Rock,	0
Evans City,	0
Harmony,	0
Mars,	0
Valencia,	0
	14
CAMBRIA—	
Johnstown,	12
Barnesboro,	1
Carrolltown,	3
Ebensburg,	1
Cresson,	4
Patton,	4
Dale,	0
Conemaugh,	0
Franklin,	0
Gallitzin,	0
Hastings,	0
Lilly,	0
Portage,	0
South Fork,	0
Scalp Level,	0
	25
CAMERON—	
Emporuim,	8
Driftwood,	0
	8
CARBON—	
Weissport,	0
Lehighton,	0
Mauch Chunk,	0
E. Mauch Chunk,	1
	1
CENTER—	
Phillipsburg,	8
CHESTER—	
Downingtown,	4
West Grove,	3
Kennett Square,	5
West Chester,	6
Coatesville,	8

CHESTER—Continued.

Atglen,	3
Embreeville,	1
Pocopson,	1
Avondale,	0
Malvern,	0
Parkesburg,	0
Phoenixville,	0
	31

CLEARFIELD—

Du Bois,	8
Clearfield,	8
Coalport,	2
Glen Hope,	3
Madera,	1
Munson Station,	2
Morrisdale Mines,	2
Osceola Mills,	3
Penfield,	3
	32

CLARION—

Clarion,	3
E. Brady,	0
New Bethlehem,	0
	3

CLINTON—

Lock Haven,	7
Mill Hall,	0
Renovo,	0
	7

COLUMBIA—

Bloomsburg,	2
Berwick,	4
Millville,	3
Orangeville,	0
Catawissa,	0
	9

CRAWFORD—

Saegertown,	1
Meadville,	5
Linesville,	8
Cochranton,	0
Titusville,	0
	14

CUMBERLAND—

Carlisle,	1
Mt. Holly Springs,	2
Boiling Springs,	1
Longdorf,	4
Newville,	1
Mechanicsburg,	4
Shippensburg,	2
Huntsdale,	0
Barnitz,	0
Shiremanstown,	0
	15

DAUPHIN—

Hummelstown,	1
Harrisburg,	1
Penbrook,	1
Dauphin,	0
Halifax,	1
Millersburg,	2
Elizabethville,	3
Lykens,	1
	10

DELAWARE—

Chester,	14

ELK—

Ridgway,	6
Johnsonburg,	3
St. Marys,	8
	17

ERIE—

Erie,	15
Corry,	12
Union City,	0
Belle Valley,	0
	27

FAYETTE—

Uniontown,	20
Brownsville,	2
Bellevernon,	0
Connellsville,	0
Dunbar,	0
Fairchance,	0
New Haven,	0
	22

FOREST—

Tionesta,	3

HUNTINGDON—

Huntinngdon,	6
Mapleton,	2
Orbisonia,	3
Mt. Union,	1
	12

INDIANA—

Blairsville,	6
Homer City,	2
Clymer,	1
Indiana,	6
Saltsburg,	0
Blacklick,	0
Creekside,	0
	15

JEFFERSON—

Lindsey,	3
Reynoldsville,	4
Brookville,	4
Big Run,	0
Brockwayville,	0
Punxsutawney,	0
Summerville,	0
	11

JUNIATA—

Mifflin,	5
Port Royal,	0
	5

LACKAWANNA—

Carbondale,	1

LANCASTER—

Lancaster,	31
Manheim,	8
Lititz,	4
Ephrata,	4
Kinzer,	2
Elizabethtown,	15
Rohrerstown,	3
Quarryville,	5
New Providence,	2
	74

LAWRENCE—

New Castle,	12
Elwood City,	4
Wampum,	0
	16

LEBANON—

Lebanon,	9
Annville,	3
Palmyra,	13
Prescott,	4
	29

LEHIGH—

Allentown,	7
Bethlehem,	2
S. Bethlehem,	2
Macungie,	1
Orefield,	1
Emaus,	2
Alburtis,	0
Catasauqua,	0
Slatington,	0
	15

LYCOMING—

Williamsport,	16
Jersey Shore,	3
Muncy,	5

LYCOMING—Continued.

Montgomery,	0
Montoursville,	0
	24

McKEAN—

Kane,	3
Smethport,	4
Bradford,	11
Port Allegany,	1
Eldred,	0
Mt. Jewett,	0
	19

MERCER—

Greenville,	6
Sharpsville,	1
Sharon,	1
Mercer,	0
Wheatland,	0
	12

MIFFLIN—

Lewistown,	12
McVeytown,	9
Newton Hamilton,	0
	21

MONROE—

Stroudsburg,	1
E. Stroudsburg,	0
	1

MONTGOMERY—

Pennsburg,	1
Red Hill,	2
E. Greenville,	0
Palm,	0
Green Lane,	2
Spring Mount,	2
Colmar,	6
Lansdale,	13
West Point,	14
Hatfield,	13
Ambler,	6
Conshocken,	1
Souderton,	1
	61

NORTHAMPTON—

Easton,	0
Bangor,	0
Nazareth,	0
Siegfried,	0

NORTHUMBERLAND—

Sunbury,	15
Mt. Carmel,	3
Milton,	6
Northumberland,	1
Shamokin,	0
	25

POTTER—

Coudersport,	6
Galeton,	0
	6

SOMERSET—

Windber,	1
Somerset,	11
Meyersdale,	3
Berlin,	0
Rockwood,	0
Salisbury,	0
Stoyestown,	0
	15

SULLIVAN—

Dushore,	0

SUSQUEHANNA—

Montrose,	1
Hallstead,	0
Great Bend,	2
Forest City,	1
	4

TIOGA—

Wellsboro,	8
Westfield,	2
Knoxville,	6
Blossburg,	0
Elkland,	0
Mansfield,	10
	16

VENANGO—

Oil City,	15
Franklin,	6
Polk,	0
Siverly,	0
Utica,	0
Emlenton,	0
	21

WAYNE—

Honesdale,	1

WARREN—

Warren,	6
Clarendon,	0
Sugar Grove,	0
Tidioute,	0
Youngsville,	0
	6

WASHINGTON—

Charleroi,	5
Monongahela,	6
Washington,	15
Canonsburg,	8
California,	0
Roscoe,	0
	34

WESTMORELAND—

Latrobe,	4
Greensburg,	10
New Stanton,	2
Mt. Pleasant,	6
Scottdale,	5
Bellevernon,	2
Avonmore,	1
Parnassus,	5
Irwin,	3
Manor,	3
Derry,	6
Jeannette,	8
Arnold,	0
Bolivar,	0
Livermore,	0
Monessen,	0
N. Bellevernon,	0
	55

WYOMING—

Laceyville,	3
Meshoppen,	1
Mehoopany,	0
Tunkhannock,	0
	4

YORK—

York,	23
Spring Forge,	2
Dillsburg,	1
Glen Rock,	1
Wrightsville,	1
Hanover,	1
Dallastown,	0
Red Lion,	0
	9

Number of counties visited,	56
Number of town visited,	327
Number of samples taken,	1,000

The number of samples sent into the laboratory by citizens of Pennsylvania was two hundred. This has been a great source of furnishing information to the dealers and buyers of feeds. Anyone who may want to have a sample of feed analyzed can have the analysis made by forwarding the same together with fee of one dollar to the Chief Chemist. A number of persons who are purchasing high concentrated feeds such as cottonseed meal, linseed meal and gluten feed which were bought on a guarantee for protein and fat and low fibre, have sent in samples and had them analyzed, to keep a check on the firms that were selling these high priced feeds. This is a capital way for men to know what they are buying. A carload of feed to-day amounts to between five and six hundred dollars, and by the investment of one dollar, the purchasers can know whether they are receiving true values or not; but so very few take advantage of this splendid clause in the law.

The Secretary of Agriculture, Hon. N. B. Critchfield, ordered prosecution last year in forty cases. Conviction was secured in thirty-nine of these cases. One case has been appealed to court and will be tried in due time. In 1910 there were sixty cases prosecuted. This shows a decrease of twenty cases. This is a chart to show that the feed conditions under our law are improving.

I am going to digress a little and call your attention to a table that has been placed in my hands a few days ago by a friend and incorporated as a portion of this report:

COMPARATIVE AGRICULTURAL STATISTICS, STAPLE FARM CROPS FOR THE YEAR 1911.

COMPILED FROM STATISTICS PUBLISHED BY UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF STATISTICS

COMMODITY	TERRITORY	Total acreage	Average yield per acre	Total production	Average farm price Dec. 1	Total farm crop value Dec. 1
BARLEY—Bushels,	UNITED STATES,	7,627,000	21.0	160,240,000	$0 86.9	$139,182,000
	PENNSYLVANIA,	7,000	25.0	175,000	65	114,000
BUCKWHEAT—Bushels,	UNITED STATES,	833,000	21.1	17,549,000	72.6	12,735,000
	PENNSYLVANIA,	291,000	21.9	6,373,000	69	4,397,000
CORN (Shelled)—Bushels,	UNITED STATES,	105,825,000	23.9	2,531,488,000	61.8	1,565,258,000
	PENNSYLVANIA,	1,435,000	44.5	63,858,000	68	43,423,000
HAY—Tons,	UNITED STATES,	43,017,000	1.10	47,444,000	$14 64	694,570,000
	PENNSYLVANIA,	3,148,000	1.00	3,148,000	$20 00	62,960,000
OATS—Bushels,	UNITED STATES,	37,763,000	24.4	922,298,000	45	414,663,000
	PENNSYLVANIA,	1,121,000	28.3	31,724,000	50	15,862,000
POTATOES—Bushels,	UNITED STATES,	3,619,000	80.9	292,737,000	79.9	233,778,000
	PENNSYLVANIA,	270,000	56.0	15,120,000	93	14,062,000
RYE—Bushels,	UNITED STATES,	2,097,000	15.9	33,119,000	83.2	27,557,000
	PENNSYLVANIA,	285,000	15.1	4,304,000	80	3,443,000
TOBACCO (Leaf)—Pounds,	UNITED STATES,	1,012,800	893.7	905,109,000	9.4	85,210,387
	PENNSYLVANIA,	46,000	1420.	65,320,000	9.5	6,205,400
WHEAT (Winter)—Bushels,	UNITED STATES,	29,162,000	14.8	430,656,000	88	370,151,000
	PENNSYLVANIA,	1,289,000	13.5	17,402,000	92	16,010,000
TOTALS,	UNITED STATES,	230,955,800	Yield Va	lue per acre,	$15 38	$3,552,104,387
	PENNSYLVANIA,	7,892,000	Yield Va	lue per acre,	$21 09	166,476,400
PERCENTAGE,	PENNSYLVANIA,	3.417%				4.687%

NOTE—No report on Acreage, Production, &c., is made by the Bureau of Statistics on Apples, Grapes, Pears, Peaches or Sweet Potatoes nor on Spring as distinguished from Winter Rye—both are combined. The figures on "Winter Wheat," for Pennsylvania, embody all Wheat raised in the State, comparatively little Spring Wheat being produced. (Compiled by William J. Rose, Freight Agent, P. R. R.)

I have been asked by a number of my friends and fellow-farmers, What have you new to present to the Board this year on the feed question? This is a hard question to answer, as this has been a year where a majority of the large firms and manufacturers shipping feeds into Pennsylvania have put forth their best efforts to comply with our law. The weed seed question has been the one that has given us the most trouble. A number of manufacturers who placed weed seeds in their molasses feed have removed the same. We waged a strenuous warfare on the manufacturers of chicken feeds. They were placing on our markets a chicken feed that contains a large amount of whole weed seeds. This was contrary to our law. The Secretary ordered prosecution and we secured conviction in all cases.

I present to you a sample of a certain chicken feed which has a large sale in our markets and which contained large quantities of weed seeds. I present to you a second sample that we found was composed of good cereals. This is a good lesson and will show you what good effect our law is when properly enforced. We find that the great trouble has been in the past with our own people. They do not take time to look into these subjects, and in place of buying good red wheat, good clean oats, buckwheat and corn to feed their chickens, which they can buy at a fair market value, they will go to the store and buy a feed that has been compounded or mixed by some firm in the far West and pay a price ranging from two to two and one-half cents a pound or from forty to fifty dollars per ton.

Here is what a member of the Board of Trade of St. Louis says in regard to these persons who come to attend the Board and buy grains to compound chicken feeds: "There are a dozen buyers there every day for chicken feed, wheat, corn and oats so badly damaged they cannot use it for any other purpose."

Pennsylvania is a great agricultural state and has great possibilities, if she could have her sons and daughters engaged in agricultural pursuits; but they go to towns and cities to make their fortunes and leave the old farm. How many of them succeed we cannot tell, nor can we tell how many fail, but in our visit to Pittsburg last week, the cry of the rich was to return to the farm, and if our young people could understand the conditions that exist in the cities, this table might be of some benefit to them. If you will take the time to read this table when this report is published, you will find that it contains some very encouraging data in regard to the average production of Pennsylvania. I would call your attention to a few of the cereals:

We will take barley. We find that the average production in the United States is 21 bushels, and that Pennsylvania produces 25 bushels, or an increase of four bushels.

Shelled corn, United States, 23.9 bushels; Pennsylvania, 44.5 bushels. Oats, United States, 24.4 bushels; Pennsylvania, 28.3 bushels. (Leaf) Tobacco, United States, 893.7 pounds per acre; Pennsylvania, 1,420 pounds per acre. In summing up the value per acre of barley, buckwheat, corn, hay, oats, potatoes, tobacco and wheat, we find the average money value per acre in the United

States is $15.38, in Pennsylvania, $21.09, or $4.29 in favor of Pennsylvania. This does not give the value of the apples, grapes, pears, peaches or sweet potatoes.

Before closing this report, I would like to call the farmers' attention to the importance of the calf meals that are being compounded and are upon our markets. These are high protein and fat and low fibre meals, and if they are fed according to the directions, you will have no trouble in raising your calves on your farms without the use of a small amount of milk, and after they get to be two months old, you can dispense with the milk and raise them on the meal. These feeds will grow the calf and develop its structural formation. I have had experience in growing calves at home with these meals. They are also splendid to feed to young pigs when you have a scarcity of milk, or to mix with milk. The price of one of them is high, but the other two meals sell at a fair price. I am here to advertise any special brand of calf meals, but I am here to try to encourage the dairymen to raise their heifer calves and by so doing, to increase the number of dairy cows in Pennsylvania.

It is a sad sight to see so many good heifer calves taken for vealing purposes, when they might produce some of the very best dairy cows and in this way increase the supply of butter and milk in our Commonwealth.

I wish to thank the Secretary of Agriculture, Hon. N. B. Critchfield, for his kindness and courtesy to me in my work as his General Agent.

I also wish to return thanks to Mr. James W. Kellogg for the many courtesies he has extended to me during the past year and for the friendly and courteous manner in which we have worked as co-laborers.

I also wish to thank Mr. John F. St. Clair and Mr. W. John Stiteler, Special Agents, for the able manner in which they have discharged their duties.

I also wish to thank Mr. John Spicer for the able manner in which he prepared our exhibit and the courtesies that he extended to the farmers who came to examine the same.

The CHAIRMAN: What is the pleasure of the Board? What shall be done with this report?

The SECRETARY: I move it be received and published in the report of the proceedings.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: Has any of the other gentlemen come in? I see that Mr. Herr has. Mr. J. Aldus Herr of Lancaster will now tell us about "The Practical Side of Local Organization in Agriculture."

Mr. Herr read the following paper:

THE PRACTICAL SIDE OF LOCAL ORGANIZATION IN AGRICULTURE

By J. ALDUS HERR, *Lancaster, Pa.*

This much talked of topic has received more attention the last year than at any previous time, and in many instances has resulted in much good to the producer as well as the consumer.

Organizations are of early origin, but most of these pertaining to the uplifting of farm life have chiefly been along the social side, and the practical part has partially been neglected. Organizations of this kind are designed to further their interests and particularly bring the producer and consumer, the farmer and manufacturer into direct commercial relations without the intervention of the middlemen.

Nearly all industries have established organizations for the betterment of their interests, even in the conservative County of Lancaster. We have two agricultural clubs that have been in existence for many years: namely, the "Octoraro Farmers" and the "Fulton Farm Club," I have read the report of these meetings when the writer was a mere boy. Then came the Lancaster County Agricultural Society, this was followed by the Grange, and more than a half dozen similar organizations pertaining to farm life, all doing work along their respective lines. But their advancement has been chiefly social instead of dealing with the more practical side of their occupation.

The question which confronts most of us is, How can we combine the two with better advantage to the majority of persons interested?

The two chief interests confronting the farmer today are more economical production, and better distribution of marketing.

Too many of the crops on the farm are produced at an actual loss, or probably just sufficient profit to maintain the industry. Following this is the finding of the best markets for the products, too often there are instances where some markets are glutted at the expense of other poorly furnished ones.

These are the two chief interests that have been neglected in most farm organizations, except a few large companies who have tried to solve the problem with some degree of success, but often being too large, and beyond the control of the producer and consumer alike.

The State and National Grange have done much good in general, but in our county it has been a dismal failure, few persons knowing there is one in existence. About twenty years ago there was a local Grange in our community, but it long since has gone the way of many other good organizations for want of actual effort. The social side was a glowing success, but the business and financial part was sadly neglected, thus the result mentioned.

Now how best to overcome these serious failures is the question to solve. The very nature of the farmers' calling should induce him to organize locally for the purpose of selling the crops he produces, and buying the articles he must have in his business, and to learn to deal more direct with the consumer and producer; thus to eliminate to a certain extent the middlemen who have been a very costly adjunct in the business life of the American Farmer.

The farmer of the future must be more of a reader and thinker for his own benefit. The more direct he deals with the consumer and producer the more intelligence he must put in his business.

After having produced a valuable crop, it requires some business and executive ability to put his products before the purchaser in the most attractive appearance with a profit to himself, as well as a reasonable price to the consumer. Not forgetting the fact that a pleased and satisfied customer is the best "ad" in any line of business and much cheaper, and more durable than printers' ink. The time has never existed when there was an over-production of a good, first-class article, if properly distributed, and goods of this class always demand a paying price, and in many instances the purchaser will look up the producer who has goods of this class for sale.

We as farmers should think more of the consumers' wants and desires, who are willing to pay good value for goods received, if in so doing they actually receive full value for what they pay. We should take a full broad view of the business relations between the producer and consumer.

The more familiar the farmer is with the life of the consumer and *vice versa*, the more satisfactory it will be for all concerned. Invite the consumer to come and see the plant where the articles offered for sale are produced, by so doing you would receive the confidence and advertising medium of a good customer, which is a long step in the line of success.

The origin of all Government is the home. The basis of all large organizations must be of local origin: no wheel is stronger than the weakest cog within its circle.

The foundation for a business organization must be laid by the members within reasonable bounds of their local community.

No one is more capable of knowing the wants and desires of a community than the residents thereof, and they should be more efficient in the management of said local organization. Whenever a company expands beyond a certain limit it becomes unwieldy and throws itself liable to many dangers which are detrimental to the control and a menace to the best development along the line of business intended. Self-government, which begins at home, is also appreciable in local organizations, and in a very great degree, means nothing more than good common sense, which is frequently lacking in many business propositions.

The country at large today is more aroused about the organization of the farmer than it has ever been before. Most dailies, and many of the most prominent magazines give considerable space to the discussion of this most worthy subject.

The place to foster this worthy child of the "Farm Organization" I believe must be in the public schools. The child who will make the successful farmer of the future must be better equipped to deal with the problems that will confront him. He must see farm life from a higher and different aspect than he has ever seen it before. The day is at hand when the manual training system of education must be the prevailing school established for the rural as well as the city districts.

The ever pressing demand for education that will train the child to be a self-sustaining bread winner, will be the power; and when started right, it will control the best interests in the United States. Then, and not till then, will the farmer receive his just demands, and the now dominating powers will give recognition when asked for, or be trodden on by the onward move of justice.

As far as farm organization has gone, it is a step in advance of education. The rural schools as well as those of the city should become a unit of power in the betterment for agricultural uplift, for the destiny of both classes is dependent upon the success of agriculture.

All other industries are at the mercy of the great calling, tilling the soil. The issue of the day is better government for local organizations. Local farm organizations have been started in many places and have proven beneficial; with few exceptions the farmer has not received his portion of the dollar in the disposal of his products, as yet these organizations have more efficient buyers than sellers. The most direct road to dispense with the middlemen's profit, is through more direct buying from the manufacturers, this end of the problem has been fairly well solved.

The Lancaster County Farmers' Association which we started five years ago, was of very humble origin, the first season ending in 1911. They did a business of $122,000.00, paid 5% on the capital stock and conducted the business on a 2½% basis. They have capitalized at $75,000.00 and have 1,000 members in good standing.

A very important feature of this organization is that all business is done on a cash basis. It is the duty of the General Manager to receive prices on all lines of goods to be purchased. If any member refuses to pay cash, he is denied the privileges of the association and cannot deal with it.

This organization has a main office, with four branches, its 1,000 members ordering all goods through the General Manager; but each branch is responsible for its own indebtedness and should any of the branches fail it cannot in any way affect any of the other branches.

At present two of the branches here built substantial brick buildings for stores, costing about $4,000 each, the two branches carrying about $18,000.00 worth of goods needed on the farm, coal, feed, flour, seeds, oils, implements and farm machinery in general. You can buy nearly everything needed on the farm from a tack to a four-horse wagon. As mentioned before the way to eliminate the middlemen is by direct selling to the consumer. If the members of an organization, like the one in Lancaster county, would unite in disposing of their crops in carloads, having some responsible man to whom to ship to regularly, it certainly would be of immense benefit to the producer.

The thousand members could create a demand for first-class products, and to a great extent, solve the problem of dividing the dollar between the producer and consumer, without the assistance of the much talked of middlemen.

But in selling direct as well as purchasing there are many problems of importance to be met, and right here is where the public schools are deficient in not giving the pupils an education on a more substantial bread-winning basis. Had the new school code of Pennsylvania given us this much needed training for the men and women of the future, we might excuse the remainder of that voluminous document.

In direct selling, there must be a confidence established between the seller and purchaser, of the highest standing; and great care should be taken that this confidence should never be misplaced.

Oh! hail the day, for it is near at hand, when the onward movement of Local Farm Organization will be heard all along the land, and the elements of resistance that are defying our advance, will listen and take warning, when many of the shackles will be cast asunder.

Then, and not till then, will the farmer receive to a large degree the profits of his toil.

The CHAIRMAN: What shall be done with this paper?

GEN. BEAVER: I move it be received and published with the proceedings.

This motion was properly seconded.

MR. BAYARD: Mr. Chairman, I would make a suggestion. This paper will be published; and I think the Constitution and By-Laws of this Lancaster County Co-operation concern should accompany it. I have had this paper written up, as I have also done with some others, and in every case a number of inquiries followed for more detailed information, so I think it would be a good idea to publish all this information with the paper.

MR. FENSTERMAKER: Would it not be well to have it put in pamphlet form? It takes so long to get out these reports. Let us do some good work while we are at it.

The SECRETARY: I think it will be well to have a little discussion on this subject. It is a very important subject. Mr. Herr is here, and he is of age and able to talk for himself. If some one will simply make a motion that the Articles of Incorporation be embodied in the paper, and the paper thus published, I will see that it is done.

GEN. BEAVER: I move this paper be received and published.

MR. FENSTERMAKER: I second that motion.

The CHAIRMAN: Any questions?

MR. MARTIN: Two and one-half per cent. pays all the expense of conducting the business. Please explain how that works?

MR. J. ALDUS HERR: As I understand Mr. Martin's question in reference to the 2½ per cent., Mr. Chairman—we have a General Manager, if that is what you want to know about our organiztaion, and he is paid 2½ per cent. on all the goods handled. Now, he is supposed to pay—suppose we have four or five carloads of coal, and a couple of carloads of bran, and he has to get a couple of extra hands in to unload it, out of his 2½ per cent. he pays their expenses. But at West Willow we also have a store manager and he is also paid 2½ per cent. Then in addition to the 2½ per cent. paid the manager, the business is also supposed to give us a dividend of 5 per cent. on the Capital Stock. So far the 2½ per cent. has paid all our expenses, and added something to our Sinking Fund besides.

A Member: Do you confine the benefits to the membership list.

MR. J. ALDUS HERR: No sir; besides the voting members who pay a dollar a year, we have contributing members at fifty cents, and these contributing members have the same benefits as I have, except that they cast no votes. Some of our members are day laborers, many of our men employ labor by the year and they know at the end of the year how much money they will have if they have no sickness. It is a matter of cash with these men. If a man wants to buy a hundred pounds sack of bran, he can buy it at the same rate that I can buy a carload, if he pays his fifty cents a year.

MR. SHOEMAKER: Suppose there is a loss, who pays that?

MR. J. ALDUS HERR: We have a fund for that purpose, which has been created out of our 2½ per cent. Our main office is at Mechanicsville; besides this we have two warehouses, one at Quarryville and one at West Willow, and if you ever come to Mechanicsville, you can see the difference between the way our buisness is carried on, and the way business is usually conducted.

MR. STOUT: Is the manager paid a salary over the 2½ per cent?

MR. J. ALDUS HERR: No sir; that pays everything, and out of it we also paid the other warehouses, and have a sinking fund, besides $18,000 worth of goods in stock.

A Member: Do you also sell good butter?

MR. J. ALDUS HERR: No sir; but we make all we can eat. We started in with eighteen members, five years ago, and have now a thousand in good standing.

MR. SHOEMAKER: Do you have trouble in buying from the Commissioners?

MR. J. ALDUS HERR: They tried to boycott us, but when we shove the cash under a man's nose, he cannot very well refuse it. It starts him thinking.

MR. HOLMAN: I cannot thoroughly understand where the 2½ per cent. comes in?

MR. J. ALDUS HERR: Well, suppose we buy a ton of bran for $20.00, we add enough to pay the 2½ per cent. salary and the 5 per cent. dividend.

The SECRETARY: You add 7½ per cent?

MR. J. ALDUS HERR: Yes, sir.

MR. GEARHART: Do you pay him a flat 2½ per cent., or do you pay a salary out of it?

MR. J. ALDUS HERR: We pay a flat 2½ per cent.

MR. RODGERS: You can pay him as the goods are sold?

MR. J. ALDUS HERR: Certainly, the $18,000 worth of goods in stock, he has not yet got his commission.

A Member: What is the amount of business you did last year?

MR. J. ALDUS HERR: About $122,000.00—a trifle over. Now we began at West Willow a little over a year ago, and until the third of this January, we had done $41.000.00 worth of business.

MR. SHOEMAKER: What is the percentage of loss?

MR. J. ALDUS HERR: I cannot tell you; I am not the manager. I am only a stockholder, and take an interest in the organization.

A Member: Do you handle binders?

MR. J. ALDUS HERR: Yes; what can you buy a binder for?

A Member: One hundred and fifteen dollars.

A Member: One hundred and twenty dollars.

MR. J. ALDUS HERR: I can save you fifteen to twenty dollars on that.

A Member: Do you handle more than one make of binder?

MR. J. ALDUS HERR: No, sir.

A Member: If you pay cash where do your losses come in?

MR. J. ALDUS HERR: Depreciation, etc. This year we put in a bid for our township schools' coal, and we put it in at fifty cents a ton lower than any one else offered to do, and paid all our bills.

A Member: Does he sell it the same as the trade?

MR. J. ALDUS HERR: Oh, no. Say bran is worth twenty dollars a ton at cost, and at the outside our price will be twenty-one dollars.

MR. HOLMAN: For instance, you buy a hundred dollars worth of goods and you add about eight dollars to it to pay the 5 per cent. for your dividend and the 2½ per cent. commission?

MR. J. ALDUS HERR: In that neighborhood.

PROF. MENGES: You capital stock is not as large as the amount of business you do, therefore that dividend of 5 per cent. on the amount of business you do is paid simply on the amount of stock subscribed?

MR. J. ALDUS HERR: Oh, no. Our capital stock is not as large as our business, and we pay the 5 per cent. dividend only on the stock paid in.

MR. SHOEMAKER: Then the manager in marking the goods, takes the market cost and adds to it the 2½ per cent. commission and then a little more to pay the dividend?

MR. J. ALDUS HERR: And to cover depreciation; there are always shrinkages.

A Member: If you buy futures like feed this fall; is that sold at a 2½ per cent. advance?

MR. J. ALDUS HERR: I think so; I am not sure, and I want to be a little careful what I say. I am only a member of the Board. But to the cost of handling there is added first the 5 per cent. for the dividend on the capital stock, and then the 2½ per cent. for the manager, and probably a little more for incidental expenses.

MR. STOUT: Don't these coal corporations refuse to sell you at this price?

MR. J. ALDUS HERR: Suppose they do? We can always get the coal elsewhere. Some of the feed people started in to boycott us, but others came along and offered to sell us because we offered cash. I know that in one case last fall we had a binder for $120.00 and a few days ago a gentlemen came along and offered me a binder for $100.00, of course I could not take it, because it would not have been good faith.

A Member: Do you handle more than one make of binder and implement?

MR. J. ALDUS HERR: I cannot answer that; we handle different kinds of implements, but I think we handle only one binder.

A Member: What kind?

MR. J. ALDUS HERR: Wood.

MR. HUTCHISON: That is not in the Trust.

MR. J. ALDUS HERR: No; neither are we.

MR. SCHULTZ: I think the last word he said was wrong. I think they are "trusting" themselves.

The SECRETARY: I think that is all right. He said "The Trust;" that is "A Trust."

MR. J. ALDUS HERR: Now, Mr. Chairman I was just going to offer a resolution, if it is proper at this time.

The CHAIRMAN: The first question is on the adoption of the paper.

MR. GEARHART: If it is in order, I move that the paper be received with the Constitution and By-Laws, and such information as the Association will give to the public, and the Department be requested to have it published in pamphlet form for the benefit of the farmers of Pennsylvania.

GEN. BEAVER: This is an amendment to the original motion, and I accept it as such.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: Now Mr. Herr's resolution is in order.

Mr. J. Aldus Herr offered the following resolution:

Resolved, That a committee of seven be appointed to inquire into and report at our next semi-annual meeting upon the appropriations needed to carry on the development of the agriculture of the State, and to co-operate with the Department of Agriculture in securing such appropriations from the next General Assembly.

On motion, properly seconded and duly carried in the regular way, this resolution was adopted.

The CHAIRMAN: This Committee will be appointed later on in the meeting.

The SECRETARY: There is nothing special before the Board just now. There is, however, one distinct characteristic of the citizens of Pennsylvania, and that is, that they cannot stay away from Pennsylvania. We have with us this afternoon a former Pennsylvanian, a distinguished worker in the field of Agriculture, one who was with us in the field some years ago. I refer to Prof. John Hamilton, of the United States Department of Agriculture. We shall be very glad to hear from him.

Prof. Hamilton took the floor, and addressed the meeting as follows:

ADDRESS OF PROFESSOR HAMILTON

It is needless to say that I am always glad to get back to Pennsylvania—particularly when it gives me the privilege of looking into the faces of the men of this Board whom I have long known, and honored for their substantial work in the interest of agriculture.

In thinking of the Board and its services to the State, I feel that some one should be deputized by the Secretary of Agriculture to write its history, not simply a history of the Board as a whole, but of its individual members.

The SECRETARY: I have been trying to get it done, but so far the Nestor has refused to be pressed into the work.

PROFESSOR HAMILTON: I think it should be done. I have been thinking while sitting here, "What if the State of Pennsylvania were to employ this body of men by the year to give their entire time and attention to the development of agriculture in their respective sections?" If so much has been done by these men, meeting three or four days in the year, what would be the result if they were to devote all of their time to the development of agriculture? I believe we have come to a time when in every state a body of experts to assist agricultural people at their homes will be employed by the year. In is coming to this that in every county in every state of this Union in which farming is an important feature there is going to be an expert giving all of his time and attention to the development of agriculture.

In the stronger agricultural counties, as Lancaster and Chester, there will be six, eight, or ten men who will do nothing else but attend to the development of their agriculture, and I may add, domestic science as well. These men will be responsible to some central agent or head, such as the State Board of Agriculture or the State Agricultural College.

There is a notable instance of the effect of that method that has just been brought to the attention of the world by the publication, in French, of the condition of agriculture in Belgium. Belgium in its political divisions is something like Pennsylvania. It is divided into Provinces similar to our counties; its population is about equal to that of Pennsylvania, numbering about seven millions, of whom about one million are farmers. Its area, however, does not compare with that of Pennsylvania. In size it is about equal to the State of Delaware.

Twenty-five years ago agriculture in Belgium was in a condition so depressed that the livelihood of the people were seriously threatened. It became necessary to do something for its development. Their wise men got together and after considering the situation at home and looking at agriculture as pursued in different other countries, adopted a plan that has proved to be marvelously successful. They did not begin with four or five experiments, but selected one and carried it on for 25 years. It consisted in the creation of an office called "Agricultural Supervisor." This supervisor was placed over the entire Kingdom. The country was divided into three divisions, and an agricultural expert was placed in each of these divisions. Later they appointed an expert for each Province. Each of these men was required to give his entire time and attention to the development of agriculture in his District. No one could be appointed to the position who did not possess a certificate as Agricultural Engineer, except an occasional man who had been conspicuous for his success along some line of agriculture, and he only after he had passed an examination before an expert board. The results have just been published and we have had the report translated in our office.

There are today thirty-two of these experts in charge of agriculture in the various provinces. As a result in the Province of Antwerp, arable land was raised in 25 years from $105 per acre to $162. Prairie land from $146 to $243; heath land that was pretty nearly valueless, went up from $4.00 to $16.00; sandy land was raised from $160 to $225. In East Flanders the best land was raised from $243 to $405,—an increase of $160 per acre.

Similar advance was made in value in every variety and character of soil, sandy, peat, bog and other kinds. There was nothing done by the State for the improvement of her agriculture but that one thing,—simply putting one or two experts into each Province to show the people the most advanced methods of agriculture.

We heard in Mr. Hutchison's paper, something about the amount of wheat grown in Pennsylvania. Here is what they did in Belgium. At the time the experiment began in 1885, they were producing in Antwerp an average of 23.75 bushels of wheat per acre; in 1910, it was 31 bushels, an increase of 7.30 bushels per acre. The yield of rye in 1885 was 23.45 bushels per acre; in 1910, it was 31.07 bushels; an increase of 7.62 bushels. Potatoes, 207 bushels per acre in 1885, as against 294 bushels in 1910,—an increase of about 87 bushels per acre. The increase for the Province of Brabant was wheat, 14.73 per acre; rye, 19.44 per acre; barley, 36.62 per acre. In beets they raised the percentage of sugar from 11 to 16 per cent. The increase in wheat for the whole country was from 24.53 to 38.55 bushels per acre, or 14 bushels. Farm animals show the same proportion of increase.

This was all brought about through the efforts of these experts. The information available was first put into their hands and they were sent out to disseminate it among the farmers. I am confident that if we were to adopt similar methods, we could have similar results. We have just as good land as any that is found abroad, just as good climate, and just as capable people, and yet we are away behind in our results. The State of Pennsylvania could not invest her money in a better way than by employing capable men to go out into the fields and apply the things, we Institute people have been preaching. I hope the day is not far distant when the State will take up this line of work,—whatever expense is involved will be amply repaid.

The Province of Ontario started a similar movement five years ago. They had great difficulty in getting an appropriation for it, but they finally succeeded and hired men to go into different districts and take up this work. Today they have thirty-two counties in which they have these experts located the entire year. All of the reports of their work are of most satisfactory character.

The result of twenty-five years successful operation in Belgium will surely justify a trial of the system in the United States.

The SECRETARY: Is Dr. Edwin Erle Sparks, of State College here? The light in our faces is such that we cannot see. If he is here, we shall be glad to hear from him awhile this afternoon. If he is not here we shall be glad to hear from the President of the Trustees of State College, who has been with us, and whom we are always glad to have with us. If Dr. Sparks is not here I propose that General Beaver take the floor.

Dr. Sparks was not in the room, so General Beaver, in response to the call of the Secretary, spoke as follows:

ADDRESS OF GENERAL BEAVER

Mr. Chairman: I have been very much interested in this little story of Belgium. The people of Belgium don't compare with the people of Pennsylvania as far as I know. They have not been educated as we have been educated. They cannot assimilate ideas as we can, and they cannot carry them into effect as we can. I know that we have better educated men than they have—even with their agricultural doctors, although they may be equal to the demands made upon them there.

Now, Mr. Hamilton spoke of Mr. Hutchison's paper. The statistics in it were furnished by a railroad agent. What have the railroads got to do with it? Why, everything! If they don't stimulate agriculture in every way they can, they won't have anything to keep up their railroads. James J. Hill understands that. He is scattering prize bulls along his road in order to raise the standard of the livestock, and he induces them to be sent each spring to Chicago to compete with other prize cattle. This is not only a stimulation to his community, but it is a stimulation, also, to his railroad which brings him in his income. Now we have been thinking that the Pennsylvania and Reading systems were doing a very generous thing when they offered to send agricultural trains into Pennsylvania. Why, it is the most selfish thing they can do, and yet it is the only thing they can do, short of a system such as Prof. Hamilton has told us about in Belgium and Ontario. We may not reach this in five, ten, or even in twenty-five years, but it will come, if not through the direct agency of the authorities of Pennsylvania, it will come through the United States. Why, there are now five bills pending before the United States Congress, one to have agricultural instruction—that is, instruction in agriculture in sufficient amounts in each state so that whatever subject the people may be specially interested in, they may get information about.

Now, I was much interested in Prof. Stewart's demonstration this morning. That was a good thing to listen to; but how many of us who have heard it will take it home with us? Now if Prof. Stewart was to go to Adams county and go to a half a dozen of the farmers there and show them by ocular demonstration what can be done, these methods would be carried out all up and down the County of Adams, which has become one of our great apple-producing regions. I asked, on one occasion our friend from Berks county, what the best apple was for all purposes; and he said "Stayman Winesap," and I have had that on my brain ever since, and several weeks ago I asked Mr. Tyson to send me a box. In a few days I got a box by express and there is no reason why Pennsylvania could not produce the Winesap, as one of the leading varieties.

My old Secretary got me to go out to the Carnegie Library last year to talk to some of the boys. A friend of his who had charge of a lot of boys in Pittsburg thought the boys might be interested in a man who had only one leg and uses crutches. Now, I never have any hesitancy to exhibit myself to boys at any time, so, of course I went. On the way he ran into a fruit shop, and knowing my fondness for apples, came out with a Winesap for me. I asked him what he paid for it; he hesitated a little, and I said "You need not be ashamed of it, Pearson; you know I value it as much if it cost two cents as if it cost twenty-five cents." He said as a matter of fact, he had paid ten cents for it. I went one year into the store of Henry Hallowell & Sons, on Broad St., below Chestnut, Philadelphia, and looking around I said, "You don't mean to tell me you erected this building?" He said, "Yes, they had just handed it over to the Real Estate Trust Co., and had it conform with theirs, so that it would rent more readily." I said, "I guess we will have to pay for it." He said, "You have paid for it." I wanted a Bellflower apple, he brought me one nicely wrapped up in a piece of tissue paper. I said, "But that is not a Bellflower." He said, "Oh, yes, it is a Western apple." I said "That accounts for it; they couldn't come up to the Pennsylvania fruit." You can't have a Bellflower without the fragrance and the taste. I wouldn't give a bushel of them for one Bellflower that comes from Centre county, Pennsylvania. And I paid five cents apiece, or sixty cents a dozen for them! Why? Because they pay attention to the picking and the packing, and consult the tastes as well as the taste of the consumer. Now, I was glad to get that box from the Tyson's the other day. Every apple was nicely wrapped up in tissue paper. They, too, are studying the tastes as well as the taste of their consumer, and there is no reason why their method should not be more generally adopted by Pennsylvania growers.

Well, now, I got off my story a little on the apple question. About these bills that are pending in Congress, I know of two or three. I heard of a couple more last night. One of them was introduced by the Senator from Georgia, who was President Cleveland's Secretary of the Interior, Hoke Smith, who has since then been Governor of Georgia. He is very much interested in agriculture. In fact, the Southern people are taking much interest in improving their agriculture, through the Department of Agriculture, of which our friend, Prof. Hamilton is an honored member—under Prof. Hays, he told me last night they have just as much pride in their agriculture in the South as we do here. Before the war, corn and cotton were kings, but now they are turning to the raising of crops such as we raise; by which I judge they are raising their corn to feed their stock and have taken to raising "hog and hominy" as well as corn and cotton.

Hoke Smith has introduced a bill, authorizing appropriation to land-grant colleges, and then giving certain amount additional in proportion to the amount appropriated by each State Legislature. For instance, it would give Pennsylvania sixty thousand dollars based upon so many millions to be divided among these states according to the amounts appropriated by their Legislatures; say the equality of Pennsylvania would be fifty thousand dollars; we would get that according to our population, providing the State Legislature would appropriate a like sum. Now, you see what this amount would mean in carrying on the agriculture in a practical way in the different counties. If you could take Stewart into the ordinary farmer's dining-room and sit around the table with half a dozen men with note-book and pencil, and have him go over his story so that they could take it down, and it would make a difference in five years such as he showed this morning, and you could sell the apples for two dollars and fifty cents a bushel, like I paid for my box from the Tyson's the other day, you see what that would mean. Why, we have not started in our apple production in Pennsylvania, although some of them think they are getting along in certain locations.

My friend Hiester, who has gone to his Heavenly home the other day, was an enthusiast along this line. When he told me ten years ago what the possibilities of apple production were in Pennsylvania, I laughed at him. In order to get even with me, he sent me from the next meeting of the Horticultural Association, a box of Baldwin and Grimes' Golden, originated in the orchards he produced. They laughed at me for three months. I recognized the quality; there is no question about that, and there is no question about the amount, if we simply get our heads together and go to work. We used to think that Western New York was the place to raise apples; well, it is not better than Pennsylvania. Our Soil Survey shows it. Some locations are better than others. The Soil Survey people put an auger down into the ground and pull it up and tell you that that is the place to plant a Baldwin.

Now, why, I don't know, but I suppose some elements in the soil. Iron will produce color, and that is the reason the fruit is lighter in color in some localities than in others. In Centre county we are underlaid with Hematite ore, and I suppose enough of it will get into the fruit to produce color. The fruit needs the minerals as well as God's rain and sunshine. You take an apple and see what is enveloped in it, in the way of high art—in the way of beauty of color, of taste, and fragrance all combined, and then compare it with the fact that one man will devote his entire lifetime to the development of a single point in agriculture, and then think he is doing a great thing, such as Dr. Armsby is doing at State College in which he puts a steer into the Respirator Carometer and measures the breath which the steer gives up every time it breathes, and knows just how much of it is waste, and how much of the feed which is given the steer is waste, and thinks he is doing a big thing; you take this, and then you can imagine what it is to take agriculture as a whole and try to undertake to carry it out. Why, gentlemen it is the biggest thing in this world, and God made it so, because we are all dependent upon it; and if we were just able to carry out the provisions of the Hoke Smith bill—I don't know just the details, but I do know the scope of it—we could revolutionize agriculture in Pennsylvania, as they will in Georgia.

We are talking about Missions, nowadays. I have been insisting for years that the mission of America to China is agriculture. We could revolutionize it; they would be more ready to accept Christianity and we could also learn something from them. Their agriculture is altogether intensive; they have no extensive agriculture such as we have, and while we show them something of our extensive methods, we could learn something of the intensive from them. Why think of what we might accomplish, if we were to establish an agricultural mission, as they are now trying to do from State College, by means of a young fellow who went over there to become a Professor in a Christian College, and they have him teaching agriculture and horticulture and landscape gardening, and about everything else they can get him to do, and he came home again and said: "If you will stand by me, we will start a little college settlement over there in agriculture to produce plants that you can use here, and we have plants here that can be introduced into China, so that we can be mutually helpful;" and they are going to try it. Why, there is just one of the things the Master did when he was in this world—he fed the men who were hungry, and then he preached to them, and I don't believe America could influence China more quickly and effectively than by showing them just how we do things in this country. If we could teach them to farm as we farm here in Pennsylvania, to cultivate as we cultivate here, I have no doubt we would never again hear the cry from more than three million dollars—yes, twice that, to save the lives of three million men who are starving because there is not enough for them to eat. And that is simply because they know nothing of farming. Instead of cultivating the river banks, which wash away, we would teach them to cultivate and develope the interior.

Any man who knows what he is doing and who farms intelligently, must use his brains as well as his muscles; brain and brawn are both required to produce results in agriculture. No man who undervalues what he is doing is fit, in my judgment, for his business, for it is the biggest on earth; and it takes brain as well as brawn to develop it in its fullest, and the man who undervalues it, undervalues himself as well as his business, and he also undervalues the sunshine and the rain of our common Father, which sink into the earth and cause it to produce for us the elements of life. We cannot overvalue it; let us value in its true place, what agriculture in Pennsylvania is, and may become to the generations that follow us, if we value it as we should and reach the largest results in our work.

Mr. Hutchison in the Chair.

The CHAIRMAN: I know you have been delighted with this address. We have been uplifted.

I have been thinking of our Fruit Show at Pittsburg last week. How it interested those people of Pittsburg—those city people—because it took them back to the farm! A little lady looked over the display of apples. I said to her, "Are you interested?" She said, "Yes, sir, we have a farm about twenty minutes out of the city in our auto." She could give you instructions; she had everything at her fingers' ends. She said last year they raised twenty-two hundred hogs; they have a big greenhouse and employ fourteen men, and last year they paid all expenses and showed a profit. I asked her how they did it. She said, "My father is a business man and keeps strict account of everything; you know him." It was Senator Flinn's daughter. She enthused me, I insisted upon her going up to State

College to take a short course in agriculture. She reads every bulletin and everything she can lay her hands on. Why, it is this enthusiasm that the world needs in agriculture. It is what Belgium is doing; they are raising, not two blades of grass, but three or four, where one grew before. That is what we will have to get to in Pennsylvania. I become very much enthused as I go up and down the State and see all these things. It makes me feel sorry I am growing old, just because of these wonderful things.

We hear so much of the high cost of living. The cost of living is high; but in spite of it, we could produce enough in Pennsylvania to feed our population at a reasonable cost, if all the dealers were honest. But you should have seen the short weights and measures, all from Allegheny county, that were shown there at Pittsburg last week. There was a raised basket of potatoes that the farmer sells at just measure, and it is here that the farmer and the consumer are cheated, in the difference between what leaves the farm, and what reaches the consumer from the dealer. We have a good bill on our statute books, but something must be done to get the produce in the hands of the housewife in the same proportion of weights and measures as it leaves the farmer.

Mr. Kahler has appointed the following committee on Mr. J. Aldus Herr's resolution: J. Aldus Herr, W. E. Perham, S. C. George, Dr. M. E. Conard, M. P. Shoemaker, I. A. Eschbach and Sylvester Shaffer.

Dr. Frear's report has been handed in and he has selected the best possible man to read it in the shape of a Chemist who can answer any question that you might want to ask Dr. Frear. Prof. Kellogg will now read Dr. Frear's paper.

Dr. Frear's paper was as follows:

LOW GRADE NITROGENOUS MATERIALS IN FERTILIZERS

By DR. WILLIAM FREAR, *Chemist*

The average complete fertilizer sold during the spring of 1911 in Pennsylvania contained about 1.5 per cent. of nitrogen, 8.25 per cent. of phosphoric acid, and 5.0 per cent. of potash, but the relative cost to the purchaser of these materials, exclusive of mixing, bagging and freight, was 36; 30; 25; that is, the nitrogen, by far the least abundant constituent, was not only relatively, but absolutely the most costly.

The use of commercial fertilizers is steadily increasing and the demand for fertilizer raw materials is growing at a similar rate, notwithstanding the larger measure in which legumes are used in our rotations and the better conservation of domestic manures, the demand for organic nitrogenous raw materials for fertilizers is growing far more rapidly than the supply of first class materials, such as bone, tankage and dried blood. The cost of nitrogen from these sources is rising far more rapidly, as a consequence, than that of rock phosphoric acid and potash.

The fact that nitrate and ammonia nitrogen now cost less than organic nitrogen from prime materials, might suggest that fertilizer makers would turn to nitrate of soda or sulphate of ammonia more largely than in the past. Fertilizer analyses do not show any marked tendency, however, toward such change. Manufacturers explain that fertilizers whose nitrogen is exclusively supplied by nitrate of soda or by sulphate of ammonia do not hold condition well, and consequently are unsatisfactory to the buyer because he cannot conveniently drill them; and that moreover, fertilizers that become available gradually through the season are better for most crops than are such fertilizers as hold all their nitrogen in immediately available form. There is a third reason he doesn't say much about, namely, that he has found a way to use cheap organic materials to supply the nitrogen and that, at least in many cases, he is supplying an important portion of the 1.5 per cent. we find present, by the use of hair, wool waste, leather, garbage, tankage and peat.

Decades ago, these cheap and abundant nitrogenous materials were tried and found wanting. While horn meal gave considerable crop return, woolen rags some, and hair, leather, and peat a little, these low grade materials, despite the large proportions of nitrogen some of them contained, were found to have only very low fertilizer value; consequently their use as fertilizer ingredients was condemned.

In recent years, this condemnation has gone to the length of requiring their use, when it occurs, to be declared. In the new fertilizer Act of 1909 for Pennsylvania, this requirement is made specific for pulverized leather, hair, ground hoof, horn, or wool waste, raw, steamed, roasted, or in any form.

Since the passage of this Act, no instance of such declaration has in any case come to my attention. Furthermore, a careful microscopic examination of thousands of samples has failed to show their presence. Yet these low grade materials continue to go by the trainload to the fertilizer factories and doubtless do not stay there, but come out in some condition in the fertilizer output.

These facts are admitted in a general way by fertilizer manufacturers. They explain that these raw materials, with the possible exception of peat, are, while employed in the make-up of the fertilizer, not introduced as leather, hair, etc., but are, in the course of manufacture, changed into other substances whose nitrogen is available; that by such use the general cost of fertilizer nitrogen is held down far below the point to which it would rise if the manufacturer were limited to high-grade sources of supply; and that the buyer is not injured because he really gets, as the result of the process employed, a highly available fertilizer.

I have yet to be convinced that the buyer is not somewhat injured because of the price he is asked to pay for this nitrogen in mixed fertilizers, even though the truth be admitted that the manufacturer has been at some expense in its treatment and has, by its general use, somewhat held down the prices of high-grade materials.

At this time, however, I desire to confine attention to the question whether the process or processes used, do really change the nature of these low-grade materials so as to increase considerably their availability.

The process is simple and consists either in disolving the hair, leather, garbage tankage, etc., in the sulphuric acid later to be used in dissolving the phosphate rock that forms the major part of the fertilizer; or, in other factories, in putting the ground rock and leather, hair, etc., together into the mixer and then adding the acid. The product is a dark, spongy material called "base goods," because it is not sold directly as a fertilizer, but forms the base or principal part of various mixtures with high-grade nitrogenous materials, nitrate of soda, sulphate of ammonia, potash salts, usually with some ground limestone to act as a dryer or neutralizer of the excess acid, and sometimes with raw, ground peat to serve as a conditioner; that is, as an improver of the drilling quality of the mixture, whenever that seems advantageous.

To determine whether such treatment fully destroys the hair, leather, etc., upon which it acts, and whether the products are really much more available to plant, I have made a careful study of the effects of the treatment upon a large number of substances, with the aid of my assistants in the Department of Experimental Agricultural Chemistry of the Experiment Station. The full description of the experiment and of its results will appear in the forthcoming report of the Station, but I have considered the question dealt with of such present importance as to warrant my placing before you at this time the conclusions thus far reached.

The list of materials studied included sole leather scrap, soft leather from glove factories, pulverized steamed leather, cleaned cattle hair such as plasterers use, rotted hair, impure wool waste, fine horn meal, impure hoof scrap, peat meal and garbage tankage, together with a sample of "base goods" from a large fertilizer factory. It was found that the treatment with acid of the strength used in the fertilizer factory, destroyed with practical completeness, the tissues of these materials, so that they were no longer recognizable under the microscope.

The treatment increased the water-solubility of the nitrogen greatly in every case. In the original materials the percentage of the total nitrogen that could be dissolved by water ranged from none in the fresh hair and sole leather to 13-14 per cent. in the rotted hair and slightly fermented horn meal; but after treatment, the water soluble portion ranged from 40 to 78 per cent. of the total nitrogen present.

Furthermore, while of the total nitrogen present as ammonia in the original materials the quantity ranged from but 0.1 per cent. in sole leather to 6.1 per cent. in rotted hair, in the acid treated materials the proportion of ammonia nitrogen to the total nitrogen ranged from 1.7 to 14.1 per cent. The increase was, therefore, very considerable, but not sufficient to warrant the manufacturer in saying, as he often does, "The process converts the nitrogen to ammonia." For clearly, most of the nitrogen remains after the acid treatment in an organic condition.

It is well known that most organic materials used as fertilizers must, before they can be taken up by the plants, be converted into ammonium salts and especially into nitrates, and that these changes are effected in the soil to varying degrees with different materials by the help of certain soil bacteria. It is needful to know concerning these nitrogenous products, how they respond to the attack of these bacteria.

The experiment included, therefore, a study upon this point. It was found that, in our soil, taken from the Station farm in a mildly acid condition, the nitrogen of the original soft leather, wool waste, and garbage tankage did not experience any change what ever to ammonia in the course of seven days, the duration of our test; but that of the nitrogen of the horn meal, 12.67 per cent., and that of the rotted hair, 15.29 per cent., appeared as ammonia at the end of this time, the other materials remaining intermediate between these extremes; whereas, a good sample of dried blood showed 19.44 per cent. of its nitrogen as ammonia after the test. In the acid-mixed materials, on the other hand, the proportion of ammoniacal nitrogen ranged from 19.6 per cent. in the garbage tankage to 84.95 per cent. in the hoof-scrap. In like manner, the nitrification test, continued for five weeks, showed in case of every material upon which it was tried a large increase of nitrification in case of the acid-treated as compared with the corresponding raw nitrogenous substance.

Finally, these laboratory tests were followed by a field test of the effect of the fertilizers, before and after acidulation, upon rye. These field tests were so affected by a mechanical source of error that I do not feel that dependence can be placed upon their indications with respect to the *individual* nitrogenous materials. By confining the attention simply to a comparison of the *group* of materials under test, the disturbing effect of this source of error are largely elminated.

Stating the results so as to show the increase in yield of air-dry rye, straw and grain harvested when the grain was still in the dough stage, in pounds per acre, the comparison is as follows:

	Pounds	Increase due to nitrogen
Rock and potash fertilizer,	882.4	---------
Complete fertilizer with dried blood,	1,391.4	509.0
Original inert materials,	11201.5	320.1
Acid treated materials,	1,599.4	717.0

It is well established that the rate of bacterial change experienced by the same material in different soils. is widely variable. I think it unwarranted, therefore, to assume that results so favorable as those above stated, will occur with acid-treated leather, hair, etc., on all soils. It is my judgment, however,—and this is supported by the results of tests made earlier at the Massachusetts Experiment Station by Lindsey upon acid-treated leather and by Haskins upon acid-treated peat, that the fertilizer manufacturers are correct in claiming that the acid-treatment of most of these materials result in a very marked increase in the availability of their nitrogen.

The SECRETARY: There is no action necessary on this paper. The action on it was taken this morning.

The CHAIRMAN: I believe we have now come to the point on the program which calls for the election of officers.

The SECRETARY: I notice in the report of the Committee on Credentials, that Col. R. H. Thomas is in the audience and wishes to be recorded as present. I think he has received his appointment from the Governor, I move you, sir, that Mr. Thomas be received as a member of the Board.

Properly seconded and carried in the regular way.

The SECRETARY: Before we go on with the next number, I want to tell you of a little experience I had the other day. I went over to the office of the Auditor General, and met for the first time the new Deputy Auditor General, and he asked me some questions about the show in Pittsburg. Then he told me that several years ago while traveling in the West he met a gentlemen whom he did not know, but both being strangers in the locality, they became acquainted and the gentlemen showed him an apple and asked him to try it. He looked at it and said it appeared like a good apple, but the gentleman said, "I want you to try it." He did so, and said, "It's a good apple." The gentleman said, "That is what I wanted to know, because we are raising these apples out in the State of Oregon." "Well," he said, "I want to tell you that you can go out into my backyard, back in Pennsylvania to any old tree, and pick a better apple than this." "Why," said the gentleman, "are you from Pennsylvania?" "Yes, I am," he replied. "So am I," the gentleman said, "and every word you say is true, but I dare not say so because it would injure my business, I am selling the Western fruit."

Now, I was very much impressed by what Deputy Auditor General said, and if Mrs. Critchfield were not present, I would like to remind you that way back in the history of the human race, it was an apple that was the cause of a good deal of trouble.

At this point Mr. Gearhart took the Chair.

The CHAIRMAN: Next in order is the election of officers. The Governor being President by virtue of his office, we will proceed with the election of three Vice-Presidents.

A Member: I nominate Horace Seamans.

MR. JOEL A. HERR: I nominate Geo. G. Hutchison.

MR. HUTCHISON: No; don't put my name down, please. These honors must go round.

A Member: I nominate I. A. Eschbach.

MR. HUTCHISON: I nominate Mr. Schultz, and move the nominations be closed and the Secretary instructed to cast the ballot.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: I take it that they are to be elected as first, second and third Vice-Presidents. Will the Secretary cast the ballot?

The Secretary thereupon cast the ballot for Messrs. Seamans, Eschbach and Schultz as Vice-Presidents.

The CHAIRMAN: Next in order is the election of the Executive Committee. We are now ready to receive nominations.

Messrs Beck, Naginey, Fenstermaker, Holman, Biddle, Wm. F., Snavely, Conard, Taylor and Black were nominated, whereupon it was moved and seconded that the nominations close.

This motion was carried in the regular way.

MR. JOEL A. HERR: I move that the Secretary cast the ballot.

This motion was properly seconded and duly carried in the regular way.

The Secretary then cast the ballot for the gentlemen as named: Messrs. Beck, Naginey, Fenstermaker, Holman, Biddle, Wm. F., Snavely, Conard, Taylor and Black to compose the Executive Committee.

At this point Mr. Seamans took the Chair.

The CHAIRMAN: Gentlemen of the Board; I certainly appreciate your kindness in electing me to this office. I hardly know what my duties will consist of, but I will endeavor to do the best I can for the Board. I thank you.

The SECRETARY: Is Prof. Menges present?

PROF. MENGES: He is.

The SECRETARY: It is possible that he may be called away, and if there is no objection, we will listen to Prof. Menges at this time.

Prof, Menges then read his report as Entomologist of the Board, which is as follows:

REPORT OF THE ENTOMOLOGIST

By PROF. FRANKLIN MENGES

The season of 1911 must have been in many ways favorable to the propagation of some insect life; especially has this been true of the Hessian fly *(Cecidomyia destructor)* and the common locust *(Rispa)* or leaf mining and skeletoning beetle, scientifically known as the *Oclontata Dorsalis.*

The Hessian fly has destroyed from 10 to 50 per cent. of the wheat crop of the State and has, therefore, cost us millions of dollars. Spraying for this insect is impossible and the insect enemies, which number so far as our present knowledge goes, from 10 to 14 different species, seem to lose absolute control of this fly during some seasons, while during other seasons they keep it in subjection and little damage is done.

DRY SEASON DESTRUCTIVE

Entomologists who have investigated the fly tell us that a dry season, especially during July and August, is very destructive of the pupa or the quiescent stage in the life history of this fly and, therefore, we would conclude that very few of the pupa of this insect would have escaped one of the longest, most extensive and destructive periods of dry weather (that of 1910) that has been experienced in the State for a long time, and yet the following season the Hessian fly was the most abundant and destructive for many years. The question naturally comes up, why is this if dry weather is such a menace to the development of this fly, and in so far as possible we shall endeavor to answer this question. In looking up the temperatures for July, August and September, 1910, we find that the weather was comparatively cool, in fact so much so that the farm crops did not suffer such extreme desiccation as they would had the temperature been higher. The same is true of the Hessian fly, for we find that the desiccating effects of the hot sun when the ground is dry have, in many instances that have been thoroughly investigated, destroyed well nigh the entire brood lying dormant in the wheat stubble and on the ground. Here we have two climatic conditions that will destroy the Hessian fly, hot and dry weather, therefore, if immediately after harvest the ground is dry, the weather hot and plowing difficult, and a wheat stubble field is known to have quite a brood of dormant Hessian fly in its stubble and on the ground it is not necessary to plow the field early to destroy the fly because heat and dry weather will do this just as well.

BOTH SOWINGS INFESTED

But, if a drought prevails, as it did in the summer of 1910, and the weather is cool, the pupa of the Hessian fly will lie in the stubble until there is moisture sufficient for the fly to change from the dormant to the adult stage, or the full-fledged fly, which, on account of there being a little rain in 1910 until very late in the fall, may not have taken place until, perhaps October, so that both early and late sowing were equally badly infested. Another thing. In some places where there was sufficient moisture together with the prevailing cool weather there may have been more than the supposed usual two broods of fly and the likelihood is there were more than the two broods in some places.

PARISAN EXPERIMENT

Dr. Paul Marchal, of the Institute Agronomique, in Paris, France, in order to determine how many broods of Hessian fly could be produced under the most favorable conditions, began a series of experiments in April, 1894. His plots of wheat were enclosed so that there would be no infestation from without. From puparia which had been collected March 12, of that same year, imagos issued April 5. These proceeded to lay eggs on the wheat growing in the plot in which they were inclosed. These eggs hatched larvae that fed on the wheat as they would in Nature's realm and changed into puparia from which flies issued May 30. These flies were put into another plot of wheat, especially prepared for them, and the third generation of flies was flying in these cases July I. In like manner a fourth generation of adults developed from this third one, by August 5, and from these the fifth generation appeared September 4, and sixth by October 18, which deposited eggs that produced larvae which changed into the puparia and went into winter quarters.

WHEAT IS GOOD FOOD

These experiments were made in France where usually climatic conditions are most favorable for the development of the Hessian fly. The likelihood is that it is seldom the case that anything like such conditions prevail in any section of this country, that food for the larvae such as growing wheat, rye and barley, which seem to be the only food plants upon which the larvae feeds, are provided in nature in anything like sufficient quantity to develop such a number of broods, but in some instances similar conditions may have prevailed last season. During July, August, September, October, and even into November of 1910 this dry and cool weather prevailed.

BRED WITH EASE

In many places on the farm, either in the unplowed stubble field, for many farmers on account of the drought did not plow until late, or in the stubble field sown with grass there was sufficient moisture for the fly to pass with ease through all its stages of development and with few of its parasitic enemies present as was the case last year, and with sufficient volunteer wheat growing either on the unplowed stubble field or on the field sown with grass to furnish food for the larvae, ideal breeding places were provided on the farms of well nigh all wheat raising farmers, for the development of perhaps three or four broods of this pest during the past season.

LIKE STUBBLE FIELDS

The stubble fields sown with grass is an especially favorable place for the breeding development of the Hessian fly, because if there has been a fair stand of clover and timothy it furnishes protection from the dessicating heat of the sun. If this has not been the case weeds will soon spring up to do the same thing. Volunteer wheat comes up early and late, depending on location, and grows and furnishes food for the larvae which go on their way of reproduction unmolested by inspectors or poisonous sprays.

FREQUENT CULTIVATION

The stubble field that is to be plowed to be sown with a second crop of wheat may have similar conditions to the ones already described as pertaining to the field sown with grass, but in this case if thhe field is plowed early and after plowing frequently cultivated to prevent volunteer wheat from growing, no food for the larvae is provided, and consequently no adult flies can develop. This is farming to destroy the Hessian fly, whereas sowing grass with the wheat and raising weeds after harvest as is the case in the stubble field sown with grass, is farming to raise Hessian flies, because here the most favorable conditions prevail.

WHY IS IT NOT WORSE?

With agricultural practices as we have described them, providing favorable breeding places for this pernicious insect during the whole period of time which it develops with volunteer wheat, which begins to germinate soon after harvest and only stops with the coming of winter, is it not a wonder that our wheat fields are not annually devastated by this insect? That they are not so devastated is due the parasitic enemies of this fly, which keep on its heels so closely that it is seldom abundant and destructive for more than a year at a time. Here is a field for investigation and original research as to how the farmer may co-operate with these parasitic enemies of the Hessian fly in his agricultural operations that it may never be abundant and thus save millions to the State and nation.

ANOTHER WHEAT PEST

The wheat midge *(Diplosis Tritic)* seems to have appeared in some sections of the State. The larvae of this insect comes from an egg deposited by the adult midge in June, in the blossoms of very young kernels of the wheat head and feeds upon the kernel and dwarfs it or causes its entire abortion. Deep plowing and either packing the chaff or using it for roughage will keep down this insect.

SPRAYING MIXTURES

In my report of 1910 I referred to the injurious effects of some insect and fungicide spray mixtures especially fungicides. It has been assumed that solid bodies can not enter the epidermis of healthy plants, and so far nothing has developed to show that they can, and with this assumption not disapproved the question naturally arises why then do arsenical sprays that have been regarded insoluble in water injure foliage. The fact that under the conditions of solubility as tested by the chemists in which a substance is exposed to the action of the solvent, which is pure distilled water, for a comparatively short time the substance may be insoluble, but the same salt, when exposed for whole nights and days at a time to water completely saturated with the gases of the air or in natural water such as is used for preparing spray mixtures and usually containing chlorides, carbonates, sulphates, etc., of the alkali and alkali earth metals in quantities as these in natural water these arsenicals become soluble. This is especially true of the arsenate of lead as it appears in the markets. W. H. Volck, of Watsonville, Cal., * *has found that the foliage of fruit trees of the Pajaro Valley, which opens to the ocean and because of the atmospheric conditions on this account becomes covered early in the evening with dew which remains on the foliage all night and often far into the day, because of the fogs that prevail and continue at times for several weeks, that here the foliage of apple trees is remarkable susceptible to such an extent as to interefere with the effective control of the codling moth by these sprays. It was found that different samples of arsenate of lead, when dissolved in natural water and when applied at the same time under similar conditions of dew and fog and the same kind of foliage, did no harm, whereas in the case of other samples the effects varied from from slight injury to well nigh entire defoliation. These effects indicate a radical difference in the chemical properties of these samples of lead arsenate which was found to be the case. For example it was found that lead arsenate as it comes into the markets usually contains the pyroarsenate, which is soluble in ammonia and the acid arsenate which are stable under acid conditions, but under neutral and alkaline conditions these change into the orthoarsenate the most stable compound, with the liberation of arsenic oxide or an alkaliarsenate, which are soluble in water and destroy foliage. From this is appears that when arsenate of lead, if prepared for spraying in water containing alkali salts, or when it is exposed on the surface of the leaves, the action of the neutral water of fogs and dews that the pyroarsenate and the acid arsenate change into the orthoarsenate, liberates arsenic oxide or an alkali arsenate which, because of its solubility, is taken into the leaf and the leaf tissue destroyed. Therefore, the orthoarsenate is the only compound that should be used in spray mixtures, and it has been found wherever this substance has been used in the pure state no burning of foliage has taken place. As already stated, the pyroarsenate of lead is soluble in ammonia, and also that when the arsenate is exposed to neutral water and water containing alkali salts, it changes into the orthoarsenate of lead with the liberation of arsenic oxide or an alkali arsenate. If, therefore, there is any pyroarsenate or acid arsenate of lead present in a sample of lead arsenate the only thing necessary is to take a sample of half an ounce or an ounce macerate it and mix with about a gill of water in a granite or porcelain lined vessel. Then add as much strong amomnia as water and mix again and heat slowly and mix while heating and finally bring the substance to a boil. Set aside and allow the mixture to settle and cool, and then pour the clear solution through a filter into a funnel. Boil the solution until about all the ammonia is driven off. To the solution that remains after the ammonia is driven off add acetic

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acid or strong clear vinegar until it is distinctly acid, then a clear strong solution of lead acetate or sugar of lead, to which a little acetic acid or vinegar has been added, if a white precipitate forms when the solutions come together or are shaken up together, then the sample of arsenate or lead contains arsenic oxide or a solution arsenic and will burn the foliage of fruit trees.

Here it seems we have at last an arsenical that can be prepared in such a way that it will not burn foliage.

The CHAIRMAN: What shall be done with this paper?

On motion, properly seconded and duly carried in the regular way, this paper was received to be filed for publication with the proceedings.

The SECRETARY: This, I believe, completes the program for the afternoon. We have still a little time before us. Has Dr. Edwin Erle Sparks, President of State College come in? I see he has. We shall be glad to have Dr. Sparks address us at this time.

ADDRESS OF DR. SPARKS

I am sorry I could not spend more time with you today, but I spent most of my time in the Department of Health, trying to convince them that I knew better where a sewage disposal plant should be located than they did. I have been beaten, I may as well confess, so I will turn to a more pleasant subject.

What can we do to disseminate more information to the common people? How can we bridge over the chasm between the people and the college and the experiment station? We have tried bulletins, more recently we have tried the experimental trains; and yet we cannot reach them—more especially, we cannot reach the boys and the homes that need the information the most.

There is a bill before the Federal Congress. Mr. Hoke Smith has the bill in charge, I believe, and we have very great hopes that it will pass the House of Representatives. Mr. Smith is very desirous to know what the sentiment is, in Pennsylvania, towards this bill, and I hope before you adjourn, the State Board of Agriculture will vote to express approval of this bill which provides that a fund of $6,000,000.00 be set aside for the purpose of spreading information on agriculture, domestic science and pursuits in rural life.

The second thought in my mind is, that I believe much of the success that has come to the College has come from the efforts of the State Board of Agriculture.

What can we do for the farm in order that we may keep our boys and girls there? How can we show that education in agriculture is just as necessary as education in reading, writing, literature and the curriculum of the public schools? The trouble is that the teachers don't know how to do this. In many states we have legislative acts requiring agriculture to be taught in the public schools, and this means that the teacher will simply take a text-book and ask the question at the foot of the page. I think it should be labelled, "First aid to the injured," because that is what it is. The last paper shows the result of scientific study, and only scientific study can properly enable one to teach agriculture successfully. Last year I was at an Institute in a state, not Pennsylvania, where the law required that a part of the Institute time should be devoted to this work, and the County Superintendent said, thirty minutes would satisfy the law. So the instructors drew lots to see which one should give this half hour's talk. Under such conditions, how can it be expected that any interest will be aroused in agriculture?

Another bill introduced into Congress is known as the "Page Bill," and provides for a sum of money to be granted by the United States for the purpose of teaching agriculture in the Normal Schools of the United States. This may help out to some degree. We must first teach the teachers the subject, and we are trying to do this to some extent by the Summer session for the teachers at State College.

Here is where you give me the opportunity to advertise as you so kindly do. The first summer we had one hundred and forty-seven teachers in the Summer session. We have only pedagogue classes, so that any class is a teachers class. The second summer we had two hundred and nineteen, and this next year we expect to have at least three hundred. The third session begins about the 19th of June and continues during the four weeks of July. Most of the teachers take the course in agriculture. They pay $3.50 a week for board, and if the price of butter does not go any higher, we still hope to be able to give them butter and not oleomargarine, even at that price. Then they pay $1.50 for room rent, and $5.00 for instruction during the six weeks session. This last five dollars is simply a nominal charge to arouse their interest, because we do not believe it pays to give something for nothing. The teachers last year spent an average of $41.00 aside from carfare. We think this is about as cheap as we can afford to make it. I ask your help in spreading these things, so that the teachers may learn of them and come to spend the last two weeks of June and the four weeks of July at the College and still have the entire month of August left for recreation.

The next item is that the new school code, as passed by the last Legislature, gives us four new assistants, to Dr. Schaeffer. One of these assistants is an expert in agriculture, and his subject is to study how to introduce agriculture in the public schools. Much will depend on this man, and much will depend on the help you give him. We have found the man; first he has been a country teacher, and later became a principal of a high school, at a salary of eighteen hundred dollars, and then entered college as a man of mature years. Now I trust you will all give Mr. Dennis, (this is his name) all the help you can, so as to make him as useful as possible in studying and establishing agriculture throughout the country. I commend Mr. Dennis most heartily to your consideration.

I will not take your time in speaking of my favorite topic—educating the country boy to take an interest in the farm, instead of leading him towards the city, as the present curriculum does. Once he is convinced that it requires some brains to be a farmer as well as a three dollar a week clerk in a store, he will want to stay on the farm.

I congratulate the State and the Board, the Secretary, and Mr. Martin, and the host of Institute workers throughout the country, on the strides agriculture is making.

This Page bill also carries a provision that calls for an appropriation of money according to the rural population in proportion to the rural population of the United States.

The CHAIRMAN: This completes the program for this afternoon. This evening we will meet at half past seven. I hope you will all be present.

The SECRETARY: I am requested to announce that the Executive Committee will meet tomorrow morning at nine o'clock in the Department of Agriculture, in the Secretary's room.

We will now stand adjourned until 7.30.

Harrisburg, Pa. Wednesday, January 24, 1912, 7.30 P. M.

Mr. Seamans in the Chair.

The CHAIRMAN: The meeting will please come to order.

MR. HUTCHISON: Mr. Chairman, I have here a resolution to offer in reference to the Hoke Smith Bill, if it is in order.

The CHAIRMAN: The gentleman will proceed.

Mr. Hutchison thereupon offered the following resolution:

"*Resolved,* That we heartily endorse Senate Bill No. 4563, supplemental to the acts for Federal support of State Agricultural Colleges and Experimental Stations, providing for National appropriations for giving instructions and demonstrations in agriculture and in home economics, applicable to rural life to persons not connected with said colleges, but residents of the State. We believe that such legislation will vastly improve the condition of the rural communities by disseminating practical information, and we call upon Comgress to enact the same into law."

I move the adoption of this resolution.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: Anything further before we take up the program? If not, we will proceed with the first number on the program, "Fertilizers," by J. H. Schultz, Chairman.

Mr. Schultz's paper was as follows:

REPORT OF COMMITTEE ON COMMERCIAL FERTILIZERS

By J. H. SCHULTZ, *Chairman*

The writer of this report has been a farmer for thirty years, but at present he is engaged in the manufacture of Commercial Fertilizers; consequently this report is written from the standpoint of the farmer, as well as the manufacturer.

The last ten years have brought about great changes in the fertilizer business. In the past when the farmer wanted to buy fertilizers, he asked the dealer for a $15.00 or a $20.00 fertilizer, and if the dealer had a brand that would sell for that price, the farmer would buy it without considering the analysis or the manufacturer that made the goods, and, if the analysis entered into the deal at all, it was only in a casual way, because in the majority of cases the farmer did not know what analysis a fertilizer ought to have in order to be of the greatest value to him. But with the aid of the State Board of Agriculture, our Agricultural College, Experiment Stations and Farmers' Institutes, the farmer of today is better informed. As a result of this education, the consumption of the better grades of fertilizers is increasing much faster than the lower grades, because the farmer has learned that he buys a unit of plant food in a high grade fertilizer for less money than the same amount of plant food can be bought at in a low grade fertilizer. When the farmer is in the market to buy fertilizer he wants plant food and if he buys a low grade goods he must very often buy two tons of fertilizer in order to get the same amount of plant food as contained in one ton of high grade goods. It costs the manufacturer as much to mix, bag and sell a ton of low grade goods as it does for a ton of high grade goods; consequently the farmer is compelled to pay the cost of mixing, bagging, selling and the freight on an extra ton, where if he was properly educated he could buy the same amount of plant food in one ton and thereby save the labor of handling the extra ton. The use of high grade fertilizer would eliminate the question of a filler which is a source of great worriment to many farmers. The fact is that the manufacturer has never made a cent of profit on the filler which is used in low grade goods and I am sure that the farmer is not benefited. When the writer is in the market for fertilizer for his own farm, he wants nothing but the highest grade of fertilizer he can get, because in that grade of goods he is sure that the manufacturer is not obliged to use a filler of any kind.

A very important point that I want to take up in this report, and that is the source from which the manufacturer derives the different elements of plant food contained in the fertilizer he manufactures; and this is a point on which the farmer has not got the proper protection. This has reference more particularly to ammonia, as a unit of ammonia in leather scrap or hair refuse can be bought for $1.00, while a unit of ammonia from animal tankage, blood or bone costs the manufacturer $3.00 or more on the present market, and when the State makes an analysis of the two different ammoniates it gives one as great a commercial value as the other in spite of the fact that one costs $1.00 and the other $3.00 per unit.

Some of our chemists tell us in the most positive terms that they can tell the source of ammonia; whether derived from leather scrap, hair refuse or from animal tankage, blood and bone. We have on our statutes a law which compells the manufacturer to print it on the fertilizer bags if he uses leather scrap or hair. We do not know of any manufacturers who are printing their bags in this way, but we *do* know that thousands of tons of leather scrap and hair refuse are used in the manufacture of fertilizers and sold to the farmers of Pennsylvania. If the chemist cannot tell where the ammonia is derived from, then it is very important for the farmer's protection that the State appoint inspectors to visit the different fertilizer plants to see what materials are used and thereby restrict the use of inferior or worthless materials.

If this method is not pursued, it will continue to work a hardship on the manufacturer who is making an honest fertilizer; because he must meet the competition of low grade materials. If the farmer was more observing to note the results obtained from the use of the different makes of fertilizers on his crops, this matter would not be so serious, as he would find that a fertilizer manufactured from animal tankage, blood and bone would give far better results than a fertilizer manufactured from inferior materials, such as leather scrap, hair refuse, etc., and he would be guided more by results in the field than by the commercial value. The writer wants it thoroughly understood that this does not reffect upon our Department of Agriculture in any way as he feels that under the present statutes the Department is doing everything in its power to protect the farmer from being imposed upon; but it is unfair that the chemist has no sure method of telling from what source the nitrogen is derived and the only methods that the writer can suggest to overcome this evil is the appointing of inspectors to vist the different fertilizer manufacturers doing business in the State of Pennsylvania.

The last few years has proven to be years of great progress in the fertilizer business, both from an inventive as well as from a manufacturers' standpoint. With the improved machinery, fertilizers can be manufactured and handled at less expense than it ever could before. The scientific man has found a way whereby he can extract the nitrogen from the air and put it in a commercial form, to be used in commercial fertilizer, and by this method he has procured a supply that is unlimited. The ammonia that is sold in this form is known as Calcium Cyanamid. A very complete article on this subject can be seen in the American Fertilizer of September 23, 1911.

Quite recently a process has been patented whereby the phosphoric acid in phosphate rock can be made available without the use of sulphuric acid, and by this method the injurious effect of sulphuric acid to the soil will be eliminated. The process consists of first grinding the phosphate rock into floats and then mix with the floats about 15 per cent. of niter cake and roast this mixture in a rotary kiln, heating the floats to a temperature of 2,700 degrees Fahrenheit.

By this process a unit of phosphoric acid can be made available at less expense that it can be done by the use of sulphuric acid, and yet it is preferable to the old method on account of the injurious effect sulphuric acid has on the soil. By this method it is possible to make a phosphate that contains 30 or 32 per cent. of available phosphoric acid and this can be done with phosphate rock containing 72 per cent. of bone phosphate of lime. The writer has given considerable of his time and means to the development of this process, and the parties interested expect to, in the near future, to put it on the market in a commercial way.

The SECRETARY: Now, while this question is fresh in my mind. I would like to ask whether anybody noticed what Dr. Frear said about the ability to distinguish the elements that went into the ammonia? I think I understood that after they had been treated with the acids it would be impossible to tell the source from which they came. Am I correct?

A Member: That is correct.

MR. JOEL A. HERR: He said you could not discover it with the microscope.

The SECRETARY: That brings me to the question of how would an agent of the Department, even if he gets into the warehouse, discover the waste from which it is made?

MR. SCHULTZ: I think the question is important enough for the Department to appoint an agent and give him authority to go and look.

The SECRETARY: How about the wool waste and hair?

MR. SCHULTZ: Wool waste cannot be used with the acid; the tanic acid will dissolve it; but the agent will find it as well as I do.

The SECRETARY: But, you know, "Birds of a feather will flock together." When a manufacturer comes into the office of a plant, courtesy will demand that he be shown around.

MR. SCHULTZ: If he is a competitor it would not; but he is far enough away not to be a competitor.

The SECRETARY: You will excuse my persistence in the matter, but this is the first knowledge I have of this and there is no one who is more interested in getting good fertilizer to the farmer than I am. I use a good deal of it on my own land, and I will say right here that I am willing to do everything in my power; but if I should employ such an agent would it not be very hard on the manufacturers of Pennsylvania? We get a very large proportion of our fertilizer from New York. Ohio, Maryland and Virginia and we would have no authority to go into these states. We could only confine our inspection to the State of Pennsylvania.

MR. SCHULTZ: It is a matter important enough to be taken up at Washington. I am a manufacturer, but my heart is with the farmer, and I am sorry for him, for he must work too hard to pay for something that is worth nothing to him.

The SECRETARY: The Inter-State Commerce Act would regulate the shipping from one state to another, but this State cannot act unless there is a law also on their statute books.

MR. SCHULTZ: The man in the other states might allow you to inspect his factory; or if not, you could prohibit his shipping into the State.

The SECRETARY: Well, now, I would like to have your opinion as a manufacturer, as to the possibility of our getting access to a warehouse where these goods are likely to be stored. I am not trying to dodge responsibilities one bit. I am only trying to get at it. Don't misunderstand me when I bring up what appears to be objections.

MR. SCHULTZ: I understand your position in the matter, but there is no question in my mind but that it should be done.

The SECRETARY: This would also include you.

MR. SCHULTZ: We have an offer open for every Subordinate Grange in the State of Pennsylvania to send a representative to inspect our works at any time. A man who wants to be honest must be ready for inspection at any time.

MR. JOEL A. HERR: I spoke to Dr. Frear, at State College, on this question, and he said it would not be possible to detect it under the microscope. And, here is another point: Our law now does prohibit it. The source must be mentioned on the sacks. But it is not done; now, you take a man and prosecute him; how can you find out where he gets his materials from, unless you are there while he manufactures? The microscope does not show it; the test is to use it.

The SECRETARY: If we have authority to go through the warehouse and find these things stored there, we would still have to prove that they are used in the manufacture.

MR. SCHULTZ: If you could protect the manufacturers of Pennsylvania, the other fellow could not come in; he could not find a market.

The CHAIRMAN: If there is nothing further, this paper will be filed and printed with the proceedings, and we will pass on to the next subject, which is the Report of the Committee on Wool and Textile Fibers, by Mr. A. L. McKibben, Chairman. Is Mr. McKibben present?

The SECRETARY: Mr. McKibben has not answered roll-call and I have not seen him. That item will have to be passed, Mr. Chairman, with the understanding that if his report appears, it is to be printed with the proceedings.

Mr. McKibben's report was sent in later and is as follows:

REPORT OF THE COMMITTEE ON WOOL AND TEXTILE FIBERS

By A. L. McKIBBEN, *Chairman*

In the year ending 1910 there were 57,216,000 sheep in the United States, having a total farm valuation of $233,664,000 or a valuation of $4.08 per head. The increase in total numbers during the last decade was 36.6 per cent.; in total farm valuation 90.4 per cent. and in valuation per head 35.9 per cent. Increase in numbers and increase in relative value per head being practically the same. The total number of sheep in the world in 1910 was 605,050,853, the United States ranking fourth, with Australia, Argentina and the Russian Empire leading in the order named.

Totally, the world's production of wool in 1910 was 2,985,000,000 pounds, representing an output of 4.9 pounds per head. While ranking fourth in number of sheep, the United States ranks third in production of wool. In 1910 the total production of wool in the United States was 328,000,000 pounds; in Australia, 718,000,000 pounds; in Argentina, 414,000,000 pounds and in the Russian Empire, 238,800,000 pounds. The fact that 3 pounds of wool represent the production per head in the Russian Empire and 5.7 in the United States explains our higher ranking. (Pounds of Wool per head is considering hereby the total number of sheep and not by the number at shearing age).

Imports of sheep in 1910 were 126,152 head, valuation being $5.52 per head. Decrease of 218 per cent. in imports, and an increase of 54 per cent. in valuation was shown during the last decade. The exports of sheep from the United States totaled 44.517, and the price per head was $4.69. During the past ten years exports decreased 182 per cent. and valuation decreased 24 per cent.

Year ending June 30, 1910, the total imports of wool into the United States were 263.938,232 pounds. having a total valuation of $51,220,844. Of all the imports, including animals and animal by-products, excepting silk, wool is the highest in value. The United Kingdom leads in importation of wool into the United States with 91,000,000 pounds; Chinese Empire ranking second and Argentina third. Mainly first and third class wool is imported. (First-class, clothing; second-class, combing; third-class, carpet or blanket).

The total production of wool in this country is 281.400,000 pounds exclusive of 40,000,000 pounds pulled wool. Every state in the Union produces wool. Pennsylvania ranks thirteenth with a production of 6,300,000 pounds. In 1910, this State had 1.030.000 sheep of shearing age, 6 pounds of wool being the average weight of fleece. The shrinkage of wool was 48 per cent., while that of the United States was 60 per cent. Pennsylvania ranks thirteenth in production, eleventh in numbers, twenty-first in shrinkage and twenty-fourth in total weight of fleece. Wyoming ranks first with 36,000,000, and Montana second with 33,600,000 pounds. Of the states east of the Mississippi, Pennsylvania ranks third as a sheep state, led by Ohio and Michigan.

SHEEP AND WOOL PRODUCTION IN PENNSYLVANIA, 1840-1910.

Year	No. of sheep at shearing age	Wool production	Wool per head
		lb.	lb.
1840,	1,767,620	3,048,564	1.75
1950,	1,822,357	4,481,570	2.43
1860,	1,631,540	4,752,522	2.91
1870,	1,794,301	6,561,722	3.65
1880,	1,776,598	8,470,273	4.77
1890,	945,002	4,800,610	5.03
1900,	776,677	4,666,062	6.00
1910,	1,030,000	6,300,000	6.00

Wool production has been associated with Pennsylvania from its very existence. In 1683, a letter by Wm. Penn states that wool production was one of the agricultural features in which the Quakers were interested. Its production gradually increased as an industry until 1840, when the number of sheep in the State reached a climax, at which point the number of sheep raised remained practically constant for more than forty years. However, improvement was going on, the production of wool increased. During this period and previous, the production of wool within the State was not constant. The fine-wool sheep gradually went westward from eastern counties around Philadelphia to Washington, Greene, Fayette, Mercer, Erie, etc., in the western part of the State. In 1880, the counties of Washington, Greene and Fayette were recognized as the breeding center of fine wool breeds of sheep in the United States.

Due to the cheaper production of wool in the West, we find that the production had decreased 2,091,449 pounds in 1890, and by 134,548 pounds more in 1900. In 1910 we have an increase over 1900, showing that the West must now compete with the East in cheapness of production of wool and mutton.

The average price of wool on the Philadelphia market in 1910 was 32c per pound. According to the recent investigation by the Tariff Commission, the duty on wool will be lowered. Expert investigators have concluded that the raising of sheep for wool alone will not be profitable with the lowering of the tariff. Therefore, the demand for wool will have to be satisfied as it has to some extent in the past, by the raising of sheep for wool and mutton. Smooth-bodied, mutton-typed, fine-wooled sheep and such medium wooled breeds as are efficient in both wool and mutton will be raised.

Pennsylvania has considerable land lying idle which could profitably produce wool and mutton. The limestone sections of this State are especially adapted for fine-wooled sheep. It is quite generally conceded that such soil will give whiteness, pliability and silkiness to wool, also affording the best pastures and abundance of winter feed.

Sheep are cheap feeders, and breeding stock can be maintained on cheap roughage rations supplemented with concentrates during pregnancy and suckling periods. Much feeds will be utilized by sheep which otherwise goes to waste. J. E. Wing says, that out the 600 known varieties of farm weeds, 576 will be eaten by sheep. This fact shows their usefulness as weed destroyers on the farm. Breeding animals of fine wool type over-pay their coat of maintenance by the wool production. Most medium and long-wooled breeds will pay from $\frac{2}{3}$ to $\frac{3}{4}$ their cost of maintenance by their wool production. Sheep can give, especially on rough land, more profitable returns than any other class of livestock. The fertility of the soil is greatly enhanced by sheep. The fertility value of sheep manure is above that of horses and cattle.

The dog nuisance and parasites keep farmers generally from going into the sheep business. The dog nuisance is exaggerated, but is a factor to be considered. Laws should be passed and enforced to limit the number of stray dogs. Care and management of his flock can keep the farmer out of danger of loss from parasites.

Silk is another animal fiber, 70 per cent. of which is produced in Asia. The production of silk is less than the demand, artificial silk being manufactured as a substitute. In 1910, $67,129,603 was the value of silk imported into the United States. Imports of silk were $15,891,759 in advance of the value of imported wool.

Cotton is the leading vegetable fiber produced in America. The cotton crop of the United States for the past year broke all previous records with a production of more than 14,000,000 bales. In 1910, 11,941,563 bales were raised, in which year the United States produced 66 per cent. of the world's crop of cotton.

The acreage of flax seed was greater in 1900 than 1910 by 794,483 acres. Production, however, was less by 354,591 pounds. In 1910 the acreage was 2,916,000 and the production 19,624,901 pounds. Importations increased by 47 per cent. during the last 10 years. Its production is mainly confined to the Central and Western states.

Government experimental results show that hemp is a most valuable fiber for the manufacture of high quality paper. As wool is not cheap enough and as the scarcity and the increasing value of wood pulp continues, the value of hemp in the production of paper may soon be realized. The production of hemp in the United States in 1911 is estimated as being 12,000,000 pounds.

Of all fibers, wool is the important one from an agricultural standing in Pennsylvania. With its suitability to wool and mutton production, this State should continue its increased production.

The CHAIRMAN: We will proceed with the next number, the Report of the Committee on Livestock, by Mr. A. P. Young, Chairman.

Mr. Young made the following report:

REPORT OF COMMITTEE ON LIVESTOCK

By A. P. YOUNG, *Chairman*

One of our leading experiment station directors is reported as saying recently: "It is the livestock of the English farms to which they owe the wonderful maintenance of their fertility." Scarcely any farmer be he grain, hay, dairy, or truck farmer has manure enough for the needs of his crops because his way of doing it does not provide for the support of a large number of growing horses, cattle, sheep or hogs to the acres he covers. So far, too little attention has been given to this matter in this country; too many of our farmers raise crops to sell as grain and hay instead of working them up into more concentrated forms and saving the resultant fertility to make the farm more productive. Every farm should have a large stock of young animals coming on and a corresponding number finishing off. In support of these he should devote the land contiguous to the barn to leguminous soiling crops and to crops for filling the silos of which he should have at least two, a small one to bridge over summer droughts and a larger one for use during the main feeding season, depending upon these and upon soiling more and upon pasturage less to maintain and finish off his animals.

Ensilage and leguminous crops, including alfalfa, will enable the farmer to feed profitably a large number of animals. When the farm of one hundred acres it able to feed thirty to fifty cows, a goodly number of young stock, besides the number of horses necessary, together with colts and hogs, either of these may be a leader, each farmer choosing the animal he fancies and his particular farm is best adapted to handle, supplementing the feeds produced with others from the market to make each animal do its best, and saving the resultant fertility to apply to the crops. That kind of farm management will soon make the farm a noted one in the community. The environment and the temperament of the farmer should both be taken into account in determining the kind of animals to receive most attention. The man who has particular liking for horses may, if his farm is adapted to their handling profitably, engage in the production of marketable horses. Horse flesh sells for more than beef, pork or lamb, indeed it will average about as high in the rough as dressed turkey and when facilities are right for handling does not cost more pound for pound than either of the first named meats. There is a wide range for choice, the draft horse, trotting horse, mule and all that lies between. The man wishing to go into horse production should be sure that he can get on good terms with his animals. They should always be pleased to see him approach. If this be so they will soon learn to have confidence in him and willingly do whatever may be required of them and their value be enhanced accordingly. Pennsylvania should raise more of the horses she needs, the conditions are all right in many section of the State to make the business profitable.

The process of subduing a new acre to supplement a worn one culminated a generation or two ago, the result of that way of doing brought into cultivation many acres that should have remained in forest. In the hilly portions of our State are to be found much land that can never be made highly fertile, the soil being light, if filled with humus it becomes lighter still and the dashing rains carry it away. Such land may be handled better by keeping it most of the time in grass either as mowing or pasture land thus enabling the keeping of more animals and making the acres more advantageously situated, more productive. We have spoken of the horse first because of the nobility of his nature and the commanding position he occupies in the economy of our farm operations.

When we come to consider the matter from a dollar-and-cents point of view the Bovine race takes first place in both number and value. Wherever it is possible to cultivate the soil, and indeed in places where cultivation is well nigh impossible, the cow and her progeny may be made to assist man in his battle for comfortable subsistance. As healthful and acceptable food producers there are no rivals. They can rough it on the mountain side or luxuriate in the valley, adapting themselves to the surroundings and to the fare provided by the locality. If milk is wanted, the developed cow is able to produce it in profusion. With equal facility some of the family with man's manipulation are made to turn out butter fat profusely. This with the solids accompanying it makes cheese possible; milk, cream, butter, cheese, veal, beef and all related mixtures and possibilities. What a bill of fare; and all from one source. The possibilities of the ox as a laboring beast is of no inconsiderable importance in some sections, this, too, is worthy of credit to this class of farm animals.

In the economy of animal food production, swine comes next to cattle, the facility with which they increase and the short time required to come to maturity makes its comparatively easy to stock up with them and get ready for an anticipated market. Some mathematical expert has figured out that a sow having a litter of six at a time in ten generations will produce 6,500,000. Nearly every farmer and many householders who are not farmers keep two or more pigs to utilize the waste of the table, the trimmings of the vegetables, all of which are turned to good account by the pig which in turn makes no inconsiderable addition to the family larder. Ham, bacon and lard, the various smoked products, to say nothing of sausage, scrapple, sparerib and other dainties prepared at butchering-time are handy to have in reach at any season of the year.

The most profitable hog is the one that will most quickly turn raw material into more valuable pork. Living and growing on suitable pasture, utilizing otherwise waste products, and requiring no great amount of extra food to round him out at the close of his career, the hog is an economical proposition to every householder who is situated so as to care for him properly. In that section of our country spoken of as the corn belt, the possibilities of the hog are immense, and even in Pennsylvania very good returns may be secured by good management even if so large herds are not kept. As in other branches of the livestock industry, the sire is important, he may not be literally, "half the herd" but in most cases much of the profit depends upon him.

In hog raising a good start is important. A stunted pig is often a losing proposition and this conditions is easily brought about by improper feeding of the mother in the early days of the youngsters lives. Little feed and that of a somewhat bulky and easily digested kind should be the rule for the first few days. After the litter is a week old if all has gone well the embargo on feed may be raised and good feed and plenty of it supplied, soon as the little fellows manifest a desire to eat a side table, accessible to them, supplied with such as they like will push them along up towards 300 pounds at eight or nine months old. Grass, clover, rape, peas are good for growing hogs; so are potatoes, apples and roots generally, remembering that potatoes and roots should be cooked.

Although the dog nuisance has nearly wiped out the sheep industry in some sections of the State, a report on livestock will not be complete without reference, at least to it. We have in Pennsylvania some sections well adapted to sheep raising. For some of our hillsides it is not best to practice a regular system of rotation cropping, on account of the tendency to wash. Some of these may be made ideal pasture lands for sheep, which, if not overstocked, will grow more and more fertile under the tread of the "golden hoof." The price of wool and mutton fluctuates more than some other commodities, but they usually bring remunerative prices at some time in the year. Wool may be stored with no risk of deterioration and is sure to be in demand at no distant day. The demand for mutton is increasing and lamb—not the cold storage kind—is nearly always at a premium. As the Western ranges are cut up into farms, sheep husbandry will return to some of the rugged hills of our State and give good returns for labor and care bestowed upon it.

Poultry is often put in a class by itself and treated as a separate production from livestock, but its aggregate value, which has been increasing very rapidly of late years, attest its importance and puts it far upon the list of income sources to him who will give the necessary care. No farm is complete without its flock of poultry. Village and town residents, too, whenever they have room have a poultry coop larger or smaller as space and inclination determine. Where other stock can not be kept, poultry may be made to consume the crumbs that fall from the table and make good returns in eggs, broilers, roasters and stews as well as in the enjoyment their care affords.

Secretary Wilson places the yearly product of poultry at 500,000,000 of dollars, truly a magnificent sum surpassed by only a few of the leading sources of income from the farm. The hen is omnipresent. The turkey, goose and duck are somewhat more restricted, but they too may be made valuable where surroundings are congenial.

There is another bird sometimes domiciled on the farm that demands a paragraph. The honey-bee, while not a beast nor bird, may appropriately be classed with the livestock on the farm. A few enthusiasts make a fair income from a bee-yard, and there is no good reason why many more farmers might not add this to their sources of profit and enjoyment, especially since so little care, expense and risk are required to secure at least a supply of honey for the home table. Buckwheat cakes and honey for breakfast on a frosty morning! Think of them!

We have up in Columbia county another species of livestock in a herd, flock or covey of ostriches. Some of them not long from over the sea, they are said to be contented, and apparently to enjoy their new home. It is not anticipated that any of their eggs will come in competition in the market or be put in cold storage for some time to come, nor will they come in competition with the turkey for Thanksgiving roast. Your Committee, however, is hopeful that in the near future sufficient of the birds and feathers may be produced for ladies' hat trimmings so that song and insectivorous birds may be exempt from such use. There may, however, be one drawback to their use in this connection; if a whole bird be mounted the hat will of neccessity have to be even larger than it is now.

The CHAIRMAN: You have heard the reading of this paper.

What is your pleasure?

MR. HUTCHISON: I move it be received and published with the proceedings.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: The next number on the program is the Report of the Committee on Dairy and Dairy Products, by Dr. M. E. Conard, Chairman.

Dr. Conard's report was as follows:

REPORT OF THE COMMITTEE ON DAIRY AND DAIRY PRODUCTS

By DR. M. E. CONARD, *Chairman*

Dairy statistics of Pennsylvania today reveal rather surprising conditions, notwithstanding the increase in population the number of cows in Penna. is less than a few years back. We also find a quite general decrease in rural population of the State, with today about 55 per cent. of the entire population living in cities, towns and boroughs leaving only 45 per cent. of the people in charge of the prinicpal source of Pennsylvania's food production. Considering that a large proportion of the 45 percent. of agriculturists by reason of location, aptitude or inclination, are following other lines of agriculture pursuits, we find the dairy business is in the hands of a comparatively small per cent. of the consuming public. And we will all agree that there is no more important branch of agriculture than the dairy. It is the one source a farmer has to sell his rough farm crops as a manufactured product, and do the manufacturing himself. The manufactured food on account of its vast importance should bring him directly into the very best markets of the State. The high cost and inefficiency of labor has done much to influence many farmers to discriminate against the dairy business. The disproportion existing between the prices demanded for commercial feeds and those paid for the products of the cow has narrowed the margin upon which the dairyman must depend for existence until it requires the most strenuous efforts and careful management to keep the head above water. Indeed, I venture the assertion, that if all dairymen in Pennsylvania were called to a financial reckoning today it would be a small proportion that could show a net profit over cost of investment, labor and feed.

There is probably no branch of the farming business where there is so much contention and dissatisfaction existing between the producer and purchaser, dealer or consumer of the finished product as in the sale of dairy products, very largely because the producer is not willing to put forth any special effort to make hs wares of better quality and worthy of a better price and put himself in a position of more independence with regard to the sale of his goods. Who ever heard of a man asking $1 per bushel for 75c potatoes, because if he could get it he would try to raise better ones next year. This is too near the attitude of the average milk producer. He wants the increased price before he improves the quality of the goods. Now these are all rather discouraging and might almost seem to be pessimistic statements, but they are conditions that confront the man who produces for us what should be the most perfect and complete food that God has entrusted to our care, the food that supports the weaker members of our families and the infants. Is it right and as it should be that this most important part of our daily food must be produced at a loss and that so many of our farmers must sacrifice the comforts of their homes and their life work in producing it because it will not yield him a profit? I hope not.

We almost daily hear of some new preparation or product of milk on the market. It is sold entire or in parts. The following are some of the many names under which we find it in trade: Milk, skim-milk, cream, butter, butter-milk, cheese, dried curd, condensed milk, evaporated milk, modified milk, sugared milk, powdered milk, kumyss, milk-sugar, malted milk, and many others. It cannot be for want of a demand for milk and its products that the business is unprofitable. There is no corner of this State so remote as to exclude it from some of the markets offered for the many products of the cow.

Taking general views of the situation, we believe the greatest drawback to profits, exists in the dairyman himself, because he so generally ignores as useless the application of methods in his dairy work and in the selection of his herd, and the feeding of it, that must and will reduce the cost of production just to the extent of his perseverance. But instead he looks to the purchaser to make up the deficiency resulting from his own negligence.

We are glad to notice that statistics show a small, per head, increase in the annual production of the Pennsylvania cow. Just how much of this is due to the extension of dairy education we are at a loss to say. There are other influences that may be at work that may not be noticed. But it does seem to us, I am sorry to say, that to a considerable extent it may be the involuntary result of the high cost of feed, scarcity of labor, coupled with the tempting prices paid for beef cattle which has resulted in many of the more beefy individuals of the herd being sold out of the dairies to reduce work and feed bills, and if this be true the result would be an unconscious culling process, hence, the per head increase. Now, whether this is the result of systematic culling or involuntary culling we do not know; probably both. But it does prove to us that if we apply the best modern methods in the selection of dairy cows and raise and keep only those individuals that will yield a profit over cost, the individual product would very soon go well above the present figures.

There is just one condition that is the limiter of the dairy profits: namely, ignorance, there are very few people who are not willing and anxious for more information provided they do not have to expose their ignorance in getting it. We do earnestly hope the diligent and persistent dissemination of dairy instruction through the entire State, taking it to those who cannot avail themselves of the instruction and excellent object lessons afforded them at the State College. The teaching how to select or breed up a profitable herd, the growing of crops on the farm suitable for their feed, correct housing and stabling, feeding to avoid waste and loss, stable care, handling and milking, handling and care of the milk, testing and preparing milk for market and selling it for what it really is, are subjects that should be carefully discussed in language and in such ways as can easily be understood and assimilated. Much of this must be done in a very primitive way for it is much like feeding strong feed to a babe, to be assimilated, must be given in small doses.

It should be generally known that the cow is an artificial animal, and to keep her from-retrograding requires eternal vigilance, and that her product is the most easily injured of all foods, but if undefiled it is the best.

Dairy sanitation seems to be the hardest dose for the less progressive dairyman to swallow. He feels that it is one more straw on the already overloaded back. It is hard for him to believe that there are thousands of active organisms who are responsible for much of the annoyance to the dairyman that are so small that their presence is only revealed to him by the results of their work. This branch of the instruction oftentimes requires much tact.

Now dairy education will do much toward establishing a wholesome respect for the business and will eventually help to narrow the gap now existing between the producer and consumer and to a great extent the margin in price.

The city business man who has his farm and dairy for recreation is an important factor in the intermingling of dairy interests as well as a valuable object lesson to his neighbors.

We believe the question of dairy improvement in all of its phases is a matter of education and much of it must be carried to the farmer at his place of business, if it is to be effective. The national increase in our population must make this fact more prominent.

The CHAIRMAN: You have listened to the reading of this paper. If there is no objection it will be accepted and printed with the proceedings.

The SECRETARY: Mr. Chairman, the thought that comes to my mind—and I think most of you will heartily agree with me—is that many a good thing has been lost because we don't apprehend it at the proper moment. I notice a gentleman in the audience from whom we will be glad to hear. Last week a great show of fruit and corn anl livestock was held at Pittsburg. We have with us a gentleman who was present, a gentleman who, in fact, was largely responsible for getting up that magnificent show. He is a modest young man, and sedate, as you will see from the length of his face. I refer to Mr. E. S. Bayard, of whom I will now call to tell us something about that show.

Mr. Bayard then spoke as follows:

ADDRESS BY MR. BAYARD

Mr. Chairman and Members of the Board: When I am called out in this way, it does kind of get my heart to palpitating. I'm very much like an old negro I used to know, who said, "If I knowed whar I come from, I'd like to go back home." You want me to tell you about the Fair. Van Norman and such bachelors ought to tell you about the "fair."

I am sorry Secretary Tyson was not here this afternoon to hear the apple session. I noticed a good many "bald'uns" in the audience.

One thing about the apple session that impressed me was, what we should *not* do so much here in the East. You noticed that Professor Stewart threw an apple picture on the screen, and I noticed how most of you were impressed with its beauty. I saw this same orchard out in Lawrence county, and this picture does not begin to show its full beauty; but instead of looking at the beauty of it, we go off into "bug" and "punk" and "rots and spots." We are all inclined to do this here in the East. Out West not one man will show you anything, or tell you anything, about bug, or blot, or rot. He tells you that where he is, is the best place in the world, and he really wants you to think so, and if you stop there very long without saying so, he will invite you to "move on"—and mean it too. Now, we here in Pennsylvania don't want to think of "moving on." I believe in Pennsylvania is really the best place in the world, and here is where I am coming to the Show I am supposed to tell you about.

This Show was gotten up for the purpose of showing city people that Pennsylvania is a great State to live in. We had a show that really was worth having the people of Pittsburg look at. Why did we take it to the city? Well, because over four hundred thousand dollars has gone from Pittsburg alone to be invested in apple orchards in the West, and not one of these people will have an apple orchard. We have had as much as two hundred and fifty thousand dollars go out from close neighbors to be invested in apple orchards in the far Northwest. What is the sense of going 3,000 miles away to raise apples, when we can raise them better at home? That is the reason why we had the show, and it was a good show. There was one thing that went wrong about it, and that was, it was no good financially. It is not a very deep hole, however, and we will creep out of it. We didn't intercede with the weatherman soon enough, but we will keep on. We had a magnificent show of livestock. Professor Van Norman sent down some splendid specimens, bred until in the fifth or sixth generation we came down to 1/264 pure bred, and they were all excellent producers. We had scores of livestock, and fruit, and lectures all the time, and the beauty of it all is that it was a Pennsylvania show. There was not a thing from outside of Pennsylvania, except one hog (I mean one four-footed hog; I don't know how many of the other kind were there); Oh, yes, and there was a few sheep; and there was nothing shown that we could be ashamed of. I hope it will be the beginning of a great fair, supported by the State. We need it; our State needs it. We need a great many other things, but we need that especially. As Mr. Hutchison says, this show seemed to bring about a better understanding between the city people and country people.

We have had in the City of Pittsburg two land shows; but they were in the interest of the South and Southwest and of Canada. It was simply giving our citizens an invitation to come and see what other states can do. Now let us do it for Pennsylvania. Let us all get together and take for our slogan the motto we have put at the head of our paper—"Boost Pennsylvania." We can do things here, if they can do things there. We can raise apples here, if they can raise them three thousand miles away from here. We can raise cattle and horses on our acres if they can do it there. There is not a single animals, unless it is the sheep, (which has dropped pretty low lately) that can't be raised in Pennsylvania. We have simply gotten out of the habit of doing things. A few years ago you could buy horses at almost any price out West. Several years ago a fellow went out to Kansas City and bought four horses when he thought he was buying one; he didn't know it until he came to take his horse away, and the dealer asked him where to send the other three. You can't do that today. There is not a state where a good horse, today will not sell for more than it cost to produce him. It is the same with cattle. I know when the price of cattle was so low that it didn't pay to raise them. It isn't so today; look at the prices and see. We can do things. The thing for us to do is to stop looking with longing eyes to Canada and the South and boost our own state. Let us go home and "Boost Pennsylvania."

The CHAIRMAN: We will now proceed with the next subject on the program, "Hydrophobia in Its Relation to the Farm," by Dr. W. Frank Beck, of Altoona.

Dr. Beck's paper was as follows:

HYDROPHOBIA

By DR. W. FRANK BECK, *Altoona, Pa.*

I have been prompted to write a paper on this subject on account of the many mad dog scares that has occurred the past summer, Then, again, I believe in educating the people on such subjects as vaccination, tuberculosis, diphtheria and hydrophobia.

If such a course was carried out as it should be, there would be less trouble and many lives would be saved. I am reminded that we are from the same people that over one hundred years were burning witches at the stake. There are thousands of people die every year of typhoid, when every case could be prevented, if we were properly educated to care for our bodies.

It is terrible to think that one-third of all the children die before they reach the age of six, for the same reason that I have just stated. Every year, over 500,000 American people die needlessly. There is no really proper energetic National, State or local effort to fight many of these diseases that kill so many people.

DESCRIPTION

Hydrophobia is a specific and infectious disease, common to all forms of animals, which may be communicated to many by direct inoculation. It is characterized by high fever, spasms, with paralysis, and always ends in death.

Pasteur has found poison abundantly present in all the nerve centers of the body, and has transferred the disease by taking bits of brain substance derived from an infected animal and inoculating them into healthy subjects. The usual mode of infection in man is through the bite of a rabid animal, the virus being contained principally in the saliva, and in an immense majority of cases the dog is the offending party. The cat, wolf, cow and horse also suffer from this dreadful disease, and in rare instance they communicate it to man.

The history of one bitten by a mad dog is something like this: The period in which you are liable to become mad after receiving the wound is six weeks to three months. The usual premonitory symptoms are fever, headache, loss of appetite, sleeplessness, great depression of spirits, and sometimes darting pains radiating from the seat of the bite and the glands that are near the wound become swollen.

The invasion is in two stages: First, the stage of excitement, the patient wearing an expression of the most intense anxiety, and the special sense exhibit the most keen vigilance, such as a draft of air or noise of any kind may cause great disturbance or violent spasms. Quite early, the mere sight of water is dreaded by the patient. This symptom is so prominent that has given the name to the disease—Hydrophobia. The mere sight of water causes great spasms to the throat, the patient having thirst that he cannot control. The muscles of the mouth exhibit convulsive movements, causing the patient to make sniffling sounds, and foaming saliva may be ejected from the mouth.

The second stage, is the paralytic stage, the patient passing into actual unconsciousness without spasms. This lasts 18 hours and always ends in death.

How shall we know if one has Hydrophobia? If the patient has fever, shows great uneasiness after he has been bitten by a dog and at the sight of water, goes into spasms, there is great indication that he has hydrophobia. This is most important, for few cases recover when once left to develop.

TREATMENT

Upon reception of a case of dog bite, thorough disinfection, followed by cauterizing of the wound with caustic is a measure that can be quickly carried out.

As soon as possible after the bite, place the mouth to the wound and suck out the poison. This is a method much used in the dissecting room by medical students and is most effective, as is eliminates the poison before it enters the circulation.

PASTEUR TREATMENT

This is a precautionary measure of the most importance. Pasteur showed that the virulence of the virus which he obtained from the nervous system, is modified by passing it through animals, the same as vaccination. He also found that if fragments of the spinal cord were suspended in a dry atmosphere, they would gradually lose their strength and finally become inert.

From a bit of the cord, treated in this manner, a medicine is made in the form of an emulsion. This is used for inoculation in man and constitutes the great Pasteur Treatment, that we hear so much about. If you were bitten by a dog that you thought was mad and sent to one of the Pasteur Institutes, your treatment would be something like this: The first day you would be inoculated with a medicine made from a cord 14 days old. You would be inoculated for nine days, each day with a cord one day fresher.

The success of the Pasteur treatment is almost universally attested, and the results have been marvelous. The patient should, however, be sent to the institution at once, as delay tends to diminish the protective power of the inoculation.

The Pasteur treatment is not used after the symptoms develop, but it must be before. After that it defies all known methods of treatment.

What I have said pertains largely to the professional side of this subject. Its relation to the farmer has a different story to tell. Any disease that effects not only the domestic animals, but his family as well, must indeed be of much interest.

I would not dare to say that there was no such disease as hydrophobia; but on the other hand, will say that it is a very rare disease in our State. In many years of practice, I have never seen a case, either in man or dog though treating many cases of dog bite under all kinds of conditions. To show you still further how extremely rare it is, I have interviewed 40 physicians whose practice has extended over many years and not one of them has ever seen a case of hydrophobia. Dr. Osler, the most widely known investigator, reports that he has only seen two cases since 1867. I could cite you to other ones of high authority that give the same history of this dreaded disease. There is scarcely a day that we do not hear of some mad dog scare, but they are mostly fakes and end in the poor dog getting the worst of it.

While working in a State laboratory some years ago I went with eminent physicians to kill a dog that had been reported as dying with hydrophobia. This dog was in a wealthy section of the city and had almost caused a riot before we had reached the place. Our object was to obtain the brain so as to examine it in the laboratory. We were fully armed for such an expedition. When we saw the dog every one agreed that this was indeed a true case of hydrophobia. The dog was killed, his head cut off and to our surprise we found a sharp chicken bone in his throat. In a few minutes we all slipped off, with our heads down, much ashamed for what we had done.

In another case where a dog showed symptoms of hydrophobia a thorough investigation revealed the fact that the dog had not had water in any form for 20 days.

During one of the very warm days this summer, I had a collie dog under close observation and I found that in 6 hours he had drank water 12 times. Among country people it is the custom to see that all the animals on the place have been watered, but the dog is left to look out for himself. I want to say that if there is any thing that will make a man or women show signs of hydrophobia, just let them do without water for 20 days.

Every dog that is frothing at the mouth, snarling and biting, or acting strange in any way, does not have hydrophobia by any means. You must remember that when a dog has pain or is distressed, it is as natural for him to bite as it for the horse to kick or for the cat to scratch.

Along this line, let me give you an example that I know to be true, and it first started me to thinking on this subject. It happened at my home while I was living at 1214 8th Ave., Altoona. I had a young collie dog. One afternoon he was in the backyard and became violent, jumping in the air and rolling on the ground, as well as clawing at his throat. Everyone that saw him, declared that he was going mad. Mrs. Beck was the only one that was at home at the time. Against the protest of the crowd that had quickly gathered, she firmly held his head between her knees pulling his mouth open, looking down, saw a large bone wedged in his throat. She took a stick and pried it out which of course, ended the trouble. Now the point that I wish to make is this: With the excitement that it made, within a few minutes some one would have turned in a mad dog scare. The police would have arrived on the scene, the dog would have been shot, and the reports gone around that a dog had been killed with hydrophobia.

Many people take no precaution as to what they feed their dogs, imagining that they can swallow anything, when in reality such food as sharp chicken bones are extremely dangerous. If you have any doubt as to whether sharp chicken bones will produce symptoms of hydrophobia, just try eating some. You are about at able to swallow them as the dog.

I am giving you these practical examples for the purpose of showing, that there may be other conditions effecting the dog producing symptoms, in most every case, similar to those of hydrophobia.

Another thing I wish to mention. In case a dog bites you do not leave them kill the dog at once. Tie him up so you can see if he will develop hydrophobia. By at once killing the dog, you destroy your best means of diagnosis.

The CHAIRMAN: What shall be done with this paper?

On motion, properly seconded and duly carried in the regular way, it was ordered to be filed for publication with the proceedings.

The CHAIRMAN: Next in order is a lecture on "Nitrogen—Its Forms and Sources," by Dr. Charles M. Stoddart, of State College.

Dr. Stoddart spoke as follows:

NITROGEN: ITS FORMS AND SOURCES

By DR. C. W. STODDART, *State College. Pa.*

"Nitrogen is, after water, the greatest factor in the creation, growth and working of nature; to bind it and be its master, that is the problem; to make use of it, therein lies real agriculture; to bring its sources which are inexhaustible into service, that it is which creates wealth."

Ever since Schultz-Lupitz, the pupil of the great Baron Von Liebig, made that statement some fifty years ago, "the nitrogen problem" has disturbed statisticians and even scientists from time to time; for nitrogen is a most necessary and useful element in human life and progress. It is useful in the manufacture of many synthetic medicines and poisons, very powerful medicines and poisons they are, too; beautiful dyes; gun-powder; celluloid; nitro-glycerine; collodion; gun-cotton. It is a necessary constitutent of human foods, for it is an integral part of every living cell, and of most bodily tissue such as muscle, skin, hair and bones.

But what is the source of this nitrogen that is so important?

For the manufacture of most of the commercial products containing nitrogen, nitric acid is used. For example, gun-cotton is ordinary cotton treated with nitric acid; collodion is a form of gun-cotton dissolved in alcohol and ether; nitro-glycerine is glycerine treated with nitric acid. Nitric acid is made from sodium nitrate. Sodium nitrate is mined in Chili and is being consumed at the rate of some 2,000,000 tons per year. Statisticians tell us that there is not enough to last more than 40 or 50 years longer. In other words, our commercial products, so useful and even necessary, are almost wholly dependent on this supply of sodium nitrate. Hence, the hue and cry about the nitrogen problem.

But what we as farmers are particularly interested in, are the sources of agricultural nitrogen which helps make our foods. Directly or indirectly food nitrogen is obtained from crops, and the source of crop nitrogen, then, is our present inquiry.

Chemically nitrogen is a gas, colorless, ordorless, rather lazy, for it does not combine easily with other elements. It forms four-fifths of the air we breathe. On every acre of the earth's surface there rests 35,000 tons of nitrogen. But only in combination with other elements is nitrogen of any value; for example in nitro-glycerine as a liquid together with carbon, hydrogen, and oxygen; in sodium nitrate as a solid together with sodium and oxygen. Only as a nitrate, that is in combination with oxygen and some base like sodium or calcium, is nitrogen of use to the ordinary crop plants.

In the soil, nitrogen occurs as complex organic compounds resulting from the decay of plants or animals—as humus, if you will. Bacteria act on this nitrogen and convert it to the nitrate form with the help of lime or some other base derived from the decomposition of rocks. The crop plants for the most part, when they are plowed under returns to the soil only then nitrogen taken from the soil during their growth. There is no gain in nitrogen. But legumes, clover, alfalfa, peas, beans—have growing on their roots colonies of nitrogen fixing bacteria which can take nitrogen from the air, and make it combine with other elements in such a way that the legume plant can make use of it, and by its decomposition furnish available nitrogen to succeeding crops. Estimates based on analyses have shown that in this way there may be added to the soil anywhere from 40 to 200 pounds of nitrogen per acre in excess of what may have been present before. This gain in nitrogen is made by merely plowing under the stubble remaining after a hay crop, or such growth as may have occurred after the crop was removed and before the spring plowing.

This is one of the most important sources of nitrogen for our crop plants: Atmospheric nitrogen made to combine with other elements and added to the soil without any labor other than the planting of the seed,—and the hay is obtained in addition to more than pay for that labor.

Another source common to every farm is barnyard manure, which is one way of returning to the soil only what has been removed therefrom, unless the stock is fed on purchased material which comes from another soil,—a case of robbing Peter to pay Paul.

The principal sources of agricultural nitrogen is commercial fertilizers. In considering these forms, perhaps it would be well to divide them into three classes:

First. Those immediately available.
Second. Those very quickly available.
Third. Those slowly available.

Of the first class *Sodium nitrate*, or Chili saltpeter, is the chief representative, although not the only one as will be shown a little later. Sodium nitrate has its nitrogen in such a form that the plant can take it up and use it in making plant tissue and seeds, just as soon as the nitrate dissolves in water, and that is as soon as it applied to the soil. This form of nitrogen is immediately available, and all of it is available at once. The sodium nitrate of commerce, containing 15-16 per cent. of nitrogen, is made by solution and crystallization of an impure material called "caliche" which is mined in large quantities from a high, dry plateau of Chili. The theory of its formation is that nitrifying bacteria—those bacteria which make nitrates in the soil—acted on large quantities of decaying vegetation which grew ages ago in the mountains above this arid plain. The base supplied in this case was sodium, so there was formed sodium nitrate instead of calcium nitrate, as would be the case in our own soils. Rains washed the sodium nitrate so formed down into the desert where the water evaporated, leaving the nitrates to accumulate.

Of the second class *Ammonium sulphate* is the principal representative. This material *possibly* can be used by the corn plant just as it is, and is hence immediately available, but for most crops certainly it must first be changed by bacteria to nitrates. This process is very rapid, for in the change of complex organic matter to nitrates, the formation of ammonia is the first step, and the hardest step. The rest of the process is easy and rapid. Consequently the nitrogen of ammonium sulphate is very quickly made available to plants.

Ammonium sulphate is made principally from the ammonia given off in the making of coal gas or coke. The ammonia is absorbed by sulphuric acid, and crystallized out. It contains 19-20 per cent. of nitrogen. Every coke oven can be equipped with the apparatus to make ammonium sulphate at very little expense, relatively speaking, and the product will more than pay for the expense of the retorts.

The third class comprises those substances containing nitrogen in complex organic forms which have to undergo decay and bacterial change in the soil before plants can make use of their nitrogen. In many cases the decay is very slow, that is, the initial decay and change to ammonia is slow. Of these very slow acting fertilizers,—these inert nitrogen carriers,—Doctor Frear has told you, and stated how they can be made more quickly available—I refer to *leather, hoofs, hair, garbage tankage, peat* and so forth.

Other forms which are quicker acting are *dried blood,* containing 10-14 per cent. of nitrogen; *fish scrap,* 7-9 per cent. nitrogen and 6-8 per cent. phosphoric acid; *tankage,* refuse from slaughter houses, not garbage tankage, containing 5-20 per cent. nitrogen and 1-14 per cent. phosphoric acid; perhaps there might be mentioned *cottonseed meal* and *linseed meal,* running about 5 per cent. nitrogen. These last products, however, are better fed to stock and the manure applied to the land.

Barnyard manure, already mentioned above, would come under this class of slow acting fertilizers for the most part, although some of its nitrogen may be in the ammoniacal form and very quickly available.

There remains two products which should be mentioned now:

Calcium-cyanamide or *lime-nitrogen,* a substance made in Europe by heating in an electric furnace a mixture of coke or charcoal and lime over which is passed a stream of nitrogen. The nitrogen is obtained with but little trouble from the air. The final product is a compound containing 17-20 per cent. nitrogen which decomposes on treatment with water to form ammonia. This of course is what happens when lime-nitrogen is added to the soil; and the ammonia can very quickly be changed to nitrates for plant use. It is a fertilizer of the second class, can be made cheaply, and is almost as good a fertilizer as sodium nitrate.

Basic calcium nitrate is a fertilizer now on the European markets to some extent, as cheap as, or cheaper than sodium nitrate and exactly as good, containing about the same amount of nitrogen, 13-15 per cent. It is made in Norway by passing air through a furnace containing an immense disc-shaped arc, some five or six feet in diameter, produced by a very powerful electric current between water cooled copper electrodes. The disc-shape of the arc is obtained by an immense electro magnet which pulls the ordinary arc out of shape. The action of this intense heat on the nitrogen and oxygen of the air causes them to unite to form oxides of nitrogen. These oxides of nitrogen are passed up through granite towers full of crushed quartz down through which trickles water. Nitric acid is formed. This nitric acid can be concentrated and sold as such, or it can be neutralized by lime and the basic calcium nitrate formed.

We have here a process which makes nitric acid for use in commerce, and nitrate for use in agriculture. Air is the source of nitrogen for useful articles and for necessary crops. We can be independent of the naturally occurring instincts of soda; its disappearance need not cause any anxiety. And more than this the farmer has in the bacteria on his clover and alfalfa roots an agency for utilizing atmospheric nitrogen which is cheap, efficient and reliable.

The nitrogen problem is solved; we have bound it and become its master; we have brought its inexhaustible sources into service.

The CHAIRMAN: You have heard this paper read. What shall be done with it?

GENERAL BEAVER: I move it be received and published with the proceedings of the Board.

This motion was properly seconded and carried in the regular way.

The CHAIRMAN: Now, I believe the meeting is open for discussion.

MR. BAYARD: I would like to ask the Professor at what price the last two commercial nitrates can be bought in the market?

DR. STODDART: I cannot answer that. I understand that the Basic Calcium nitrate is sold in London at about the same as the Sodium nitrate. I understand there is not enough in the market to supply the entire market, but it is constantly increasing. For instance, in Norway they are putting up two immense factories, which will materially increase the supply.

MR. BAYARD: Do you know if they have large lime deposits, or coal deposits, or do they expect to produce it from their furnaces?

DR. STODDART: Lime deposits, yes, but coal deposits are not necessary. Pennsylvania is in position to produce it very largely.

MR. CREASY: I understand that the State of Ohio expects to be able to produce it at a profit from the smoke from the iron works.

DR. STODDART: Yes, sir.

A Member: Figuring one hundred pounds of soda and sixteen pounds of nitrate, what effect would this have on the soil?

DR. STODDART: You would have to include the three elements of soda, nitrate and oxygen; I cannot tell you the percentages, but it runs something like 25 of soda, 14 of nitrogen, and 48 of oxygen.

A Member: But how would it affect the soil?

DR. STODDART: The long continued use of Soda nitrate takes up the nitrogen and leaves an alkali soil; it leaves soda carbonate which carries no acidity and leaves an alkaline tendency.

A Member: Then in connection with South Carolina rock, the one would counteract the other?

DR. STODDART: Yes, that would be the tendency in the long run. If you cross sodium carbonate and acid phosphate, you lose the nitrate.

DR. CONARD: If I had a moment, I would like to emphasize some of the statements made by Dr. Beck, relation to the fake, hydrophobia.

The statement of the Doctor conveyed the impression that there is a tendency to choke in hydrophobia. There are a great many mistakes of that kind made both ways. Oftentimes we have such a dread of hydrophobia, that people are rather apt to lose their heads, and it is a fact—perhaps the best thing would be to go a little further and describe the symptoms, and in order that we may recognize them, let us take a few minutes.

It is a fact that there is a time in the early symptoms of hydrophobia, that it looks something like a boy about to be choked. The symptoms come on slow, just as Doctor Beck has described them. In the case of a human patient he will have a fever and if it be a dog, he will have more affection than before. He feels that he is sick, and wants your protection, but is still conscious and able to eat. A little later his eyes become very much blood-shot, but he is still as affectionate as ever, and that is where the danger comes in. In a short time paralysis of the throat sets in and causes the lower jaw to drop a little, perhaps one-fourth of an inch, perhaps an inch, and he is unable to get his mouth shut. There is no sign of shaking or other trouble, simply his mouth does not shut, because his throat is paralyzed. In large dogs, such as the St. Bernard, or Newfoundland which are of a nervous type, they nearly always go through the paralytic form while the little dogs, like the terrier, usually are attacked with the spasmodic form very early. It is in the big dog in his paralytic stage, when you sympathize with him because he has been so good, so true, that there is the danger. If he is choked, he will tell you so clearly enough. In the paralytic form of hydrophobia, the dog may be entirely quiet, possibly for quite a while, but at any moment something is likely to excite him, and he will fly into a fit. As a practicing veterinarian, whenever any one comes to the house to see me for a dog, I have left instructions at home to have them keep that dog chained until I can see him, absolutely away from all people. That is just the time the danger occurs. A little precaution in time will often save a great deal, and I think we should all become familiar with the early symptoms so as to be able to in a measure recognize the disease when it appears.

The CHAIRMAN: Perhaps the discussion has been carried on long enough. I see there are some sleepy heads in the audience, and I don't know how much to fine them. The new Chairman has not limited the amount—

The SECRTARY: There is no limit.

The CHAIRMAN: Perhaps it will be well to bring this discussion to a close.

The SECRETARY: Mr. Chairman, will you allow me to state that we cannot have the pleasure of listening to Dr. Marshall tomorrow morning. He was operated on yesterday for appendicitis, and while he is getting along very well, he will not be able to be here, and so far no report has been handed me to read for him.

MR. J. ALDUS HERR: The Special Committee on Legislation will please meet in Mr. Martin's room before ten o'clock tomorrow morning.

The CHAIRMAN: You will please take notice of this arrangement. If there is nothing further, the meeting stads adjourned until tomorrow morning.

Adjourned until 9 A. M. Thursday morning.

Harrisburg, Pa. Thursday Morning, January 25, 1912.

Mr. Schultz in the Chair.

The CHAIRMAN: The meeting will please come to order. We will proceed with the program. The first subject on the program is the Report of the Committee on Poultry, by W. Theo. Wittman.

MR. HUTCHISON: That report was made yesterday, Mr. Chairman.

The CHAIRMAN: Next comes the Report of the Veterinarian, by Dr. C. J. Marshall.

COL. WOODWARD: Before proceeding with this program, it has occurred to me and to some others that it would be well to have a Committee on Resolutions by which the resolutions that come up should be digested and revised. I move you, therefore, that hereafter there shall be included in the regular standing committees, a Committee on Resolutions, to be selected by the Executive Committee, and reported in the same manner that the other standing committees are reported.

The reason for this is that a resolution may be offered and passed, often hastily, that is not befitting the dignity and standing of the State Board. It seems to me that this committee should be appointed, and such resolutions as are desired, be brought before the Board, revised and amended, if necessary, by the Committee before they are passed. I think that in this way they will be more representative of the sentiments of the Board, than if passed without such consideration. I would ask that the motion be brought before the house.

The SECRETARY: I second it.

Having been properly moved and seconded, this motion was duly carried in the regular way.

MR. BRONG: That resolution cannot successfully be fulfilled for the resolutions that will be offered at this meeting, can it?

COL. WOODWARD: I think that possibly it can, if the resolution is sent by the Secretary to the Executive Committee which is now, or will be shortly, in session in the Department of Agriculture.

The SECRETARY: Your idea is that this resolution and motion is sent to the Executive Committee, so that that Committee can do its duty at once, by appointing this Committee on Resolutions?

COL. WOODWARD: That was my thought sir, when I offered the resolution.

MR. SNAVELY: The gentleman from Centre does not designate the number.

COL. WOODWARD: That can safely be left to the Executive Committee, I think.

DR. CONARD: It does away with the Committee on Resolutions usually appointed at each meeting?

COL. WOODWARD: Yes, sir. It gives it dignity and standing.

MR. BRONG: Will there be a Committee on Resolution appointed at this meeting?

The SECRETARY: I doubt it, because this motion calls for its appointment by the Executive Committee.

MR. SNAVELY: I think that committee will be appointed within the next half hour, because the Executive Committee will go into session very shortly, and can appoint this Committee on Resolutions at once.

COL. WOODWARD: If that motion has been passed, I see no reason why it should be put into working order this afternoon.

MR. BRONG: I have a resolution to offer at this time. I with others, was very much interested in the discussion of the fertilizer question yesterday afternoon. We have a fairly good fertilizer law in this State, but it was yesterday admitted to be of little value, and the buyer of commercial fertilizer has been calling for a good many years for better protection. I, therefore, offer this resolution.

"*Be it resolved* by the State Board of Agriculture in session at Harrisburg, Pennsylvania this 25th day of January, 1912, as follows:

That we earnestly recommend at our next Legislature, such legislation as will give the purchaser of commercial fertilizers positive knowledge of the source or sources of the nitrogen, phosphoric acid and potash contained in said fertilizer, by requiring the manufacturers to make specific statements of such source or sources on each package placed in the market.

Resolved further, That refusal to comply with the statute after enactment, should be made punishable upon conviction by a suitable fine and disbarment of any brand so marked, or any other brand of same plant food-content by such convicted company, from sale in this Commonwealth.

This resolution was given to the Committee on Resolutions about to be appointed by the Executive Committee.

The CHAIRMAN: The next subject on the program is the report of the Veterinarian, by Dr. C. J. Marshall.

The SECRETARY: I made a statement yesterday that Dr. Marshall is unable to be here. He is in the hospital, having just undergone an operation for appendicitis.

The CHAIRMAN: The next subject on the program is the Report of the Sanitarian, Dr. W. H. Banks. He does not appear to be here, so we will proceed with the next number, which is the Report of the Microscopist and Hygienist, Prof. J. W. Kellogg.

Prof. Kellogg delivered the following address, which was accompanied by a number of interesting and instructive illustrations:

REPORT OF THE MICROSCOPIST AND HYGIENIST

By PROF. JAMES W. KELLOGG

At our meeting last year an attempt was made to illustrate how the microscope has been of great aid to the scientist in the investigation of food adulterations, and the detection of the source of disease, and to bring before you the importance and need of a law which would regulate and control the sanitary conditions of the communities in which we live.

It is a well established fact that a great deal of ill health and many diseases have been caused by the unsanitary manner in which many of our cities and towns have been conducted. The source of the water supply has not been protected. Creameries and milk depots have not been kept clean. Sewers have been left open and refuse matter and all sorts of filth have been left uncovered and exposed in the streets, alleys and back yards. This state of affairs has not only existed in the past, but may be found to exist to-day, if one should take the trouble to investigate.

It is right and proper that we should have pure and unadulterated food, that we should be so protected from fraud as to be able to obtain food which is wholesome and free from injurious or poisonous substances; but it is much more right and proper that the source of food contamination be eliminated, and that markets, cafes and restaurants where food is sold and prepared for consumption, be so clean and sanitary that no fear of sickness or spread of disease need be entertained. If we are to have these clean and sanitary places, it is necessary that the energy of every citizen be devoted to a campaign for cleanliness, and that we see to it that not only our streets and neighbor's premises are free from filth, but that our own back yards are in the proper condition to prevent the spread of disease.

We know from sad experience how often a whole community has suffered from the outbreak of an epidemic of some dread disease, and how often the cause of the trouble has been traced to a polluted stream, an uncovered sewer or the presence of filth of all sorts, in which is bred the agencies known to be capable of spreading disease. It has been proven that one of the greatest agencies engaged in the spread of disease is the house fly. It does not seem possible that so small a form of life could cause so much trouble, but all the facts in the case point to the fly as one of our greatest enemies. Anything which is conducive to the existence of the fly or the conditions which promote their breeding is, therefore, responsible for the spread of disease. The favorite breeding place of the fly is in horse manure and other excrementitious matter, and many other forms of decayed animal and vegetable refuse. It would not be stating the case too strongly to say that any city, town or person permitting the breeding places of flies to exist, is directly responsible for the spread of sickness and ill health. "Eliminate the cause and you eliminate the effect," and to eliminate the breeding places of flies is what must be done if we expect to succeed in any campaign against the fly. It has been demonstrated by scientists who have made exhaustive experiments, that the house fly can and does spread typhoid fever, dysentery, tuberculosis, Asiatic cholera and is capable also of transmitting leprosy, erysipelas and smallpox.

There are a great many species of the fly, but the one which we are concerned most about is the common house fly. This insect in its development from the egg to the adult, passes through several complete changes, "each unlike the other: The egg, the larva or maggot, the pupa or resting stage and the imago or full grown insect." Dr. L. O. Howard, of the Bureau of Entomology of the U. S. Department of Agriculture, reports that the fly commonly lays its eggs upon horse manure, about 120 eggs being deposited in one mass, usually in several layings. At the end of twenty-four hours the larva or maggots are hatched. They begin feeding at once and thrive and grow for from five to seven days. At the end of this time, they crawl into the loose ground or under dry boards or into dry places and enter the pupa or resting state. This period occupies from five to seven days and in some cases a little longer. Then the fly comes forth fully developed, the total life round requiring, therefore, from ten to fourteen days. This time is influenced somewhat by climatic conditions, requiring a shorter or longer time, according to the cold or warmer temperatures. Durng the winter the adult fly hibernates in some warm or favorable place and becomes active again in the spring. The size of the fly is also influenced to some extent during the larval or growing period. If the larva are well fed, the flies will be full grown.

Prof. Wm. B. Herms, of the University of California, reports that he has estimated the number of larva which had hatched in four samples of manure, weighing in all fifteen pounds, and that 10,282 were found present. This would average about 685 larva per pound. By estimating the weight of such a pile of manure, astonishing figures can be obtained. Many other similar experiments have been made, and it is easy to understand the reason why such great numbers of flies exist in the neighborhood of stables or places where decaying vegetable or animal matter is exposed. The way in which the diseases mentioned are spread, is by the flies migrating from one place to another, alighting upon all sorts of refuse material to obtain their food and then, of course, going into the house, crawling over our food, eating utensils, getting into milk and water, and also by crawling over our bodies and sometimes getting into the mouth. They are especially dangerous to infants where bottles and milk are not kept covered or away from them. The legs and bodies of the flies are covered with small hairs to which germs easily cling.

Prof. Herms also reports that the number of bacteria which a single fly may carry will reach all the way from a few hundred to several millions and these germs, under favorable circumstances, will live as long as twenty-three days. Early in the fly season the numbers of bacteria are comparatively small, while later, this number increases greatly. The mouth parts of the common house fly are not adapted to biting or stinging as is commonly believed. Other species of the fiy, one of which is the stable fly, has a mouth part so constructed as to be able to pierce the skin. This form of insect can inject disease into the blood directly. The danger in the flies which infest our dwelling places lies in their power to carry germs on their bodies to food as above stated. Typhoid fever is one of the most serious diseases of man, and because the fly has been so energetic in transmitting this ailment, Dr. Howard has called this insect the "typhoid fly." Typhoid fever has been prevalent in many of our army camps, and it is now known that it was caused by the large number of flies, which, in turn were caused by the unsanitary manner in which the camps were cared for. During the Spanish American War, the Army Surgeons were especially energetic in their campaign against sickness, and by eliminating all sources of breeding places, typhoid fever was reduced to a minimum. From all the information we can gain on the subject, it is clearly evident that if we are to wage a war against the fly and enter into the "Swat the Fly" campaign, it will be necessary to go further than killing all the adult flies and to prevent their coming into existence.

The Health Officer of every community should see to it that every section of the town or city is kept scrupulously clean, if the sickness in that town or city is to be reduced to a minimum. Many methods have been suggested for taking care of the refuse material, such as building closed receptacles in which to place refuse of all sorts, removing it from time to time in closed wagons, and by the use of chloride of lime, solution of Paris green, kerosene and other similar substances.

Bulletins have been issued by the United States Department of Agriculture, in which instruction is given along these lines, and these bulletins can be obtained by writing to the Superintendent of Public Documents at Washington.

The amount of money which has been spent for screens, fly paper and fly poisons in the United States would amount to many thousands of dollars, and the number of deaths, which cannot be estimated in dollars, which can be directly traced to the fly, will reach into the thousands. The value of real estate in fly infested districts has been materially reduced, and wherever this pest thrives in great numbers, it is easy to understand what an enemy they are. It is earnestly hoped that a strenuous campaign will be waged in every community against the unsanitary conditions which promote the breeding of flies, and that no effort will be spared to get rid of this pest and protect the lives of our people.

DR. CONARD: Did you notice any difference in size between the small fly that lights on the cow's horn, and the house fly?

PROF. KELLOGG: Yes, sir, that is a different species. There are over a thousand different species of flies, and the fly you refer to is not an undeveloped fly, but a distinct species.

DR. CONARD: How far will a fly travel from his home?

PROF. KELLOGG: There have been instances where they have been known to cross to Europe, following a ship.

DR. CONARD: But, ordinarily, in search of food, I mean.

PROF. KELLOGG: Oh, several miles, I suppose. The motor muscles are one-quarter of the weight of the fly, so you can see how strong they are.

MR. HUTCHISON: I understand from your report that much of the danger can be overcome by keeping the manure covered?

PROF. KELLOGG: Yes, sir.

The SECRETARY: Then the danger can be largely eliminated if the manure is taken out at once?

PROF. KELLOGG: Yes, sir.

MR. JOEL A. HERR: Plaster or South Carolina rock covererd over it, will that have any effect?

PROF. KELLOGG: Not so much.

MR. J. ALDUS HERR: What would be a practical way of taking care of the manure where you have forty or fifty cattle?

PROF. KELLOGG: Spread it as soon as possible, although I admit it is a big problem.

MR. JOEL A. HERR: You don't want to use lime because it dries up the ammonia, and you don't want to use kerosene because it kills the crop.

PROF. KELLOGG: Spread it at once, although that is a problem that is largely individual. Of course, on a large farm, I think the idea is to spread manure as soon as possible. This is important in several ways.

A Member: Did you make any investigation as to whether there would be any flies where the manure is hauled out at once and spread?

PROF. KELLOGG: No sir, I never have, but I think there would be no question about it. You notice the mouth there. It is possible that the fly takes his food only in liquid form. If it cannot get it in liquid form it puts out some slimy substance with which it covers the dry food.

A Member: How does the fly manage to get through the winter?

PROF. KELLOGG: I think they hibernate; most of them come through quite a severe winter. Up in Massachusetts, I am told, a man discovered quite a number of them in his cellar. They have to thrive, because we have them every year.

A Member: I have noticed in taking out old sacks in the spring, that they would be full of them.

The CHAIRMAN: What is the pleasure of the meeting, concerning this able report to which we have just listened?

MR. HUTCHISON: I move it be received and published with the proceedings.

This motion was properly seconded and duly carried in the regular way.

MR. J. ALDUS HERR: Mr. Chairman, I would just suggest that the Committee on Legislation meet in Mr. Martin's room at ten o'clock.

DR. BECK: The Executive Commtitee will meet at once in Secretary Critchfield's room.

MR. JOEL A. HERR: I move that while we are here, we proceed to discuss a place for the summer meeting.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: We are ready to entertain invitations to different places for the summer meeting.

MR. J. ALDUS HERR: I nominate Bradford county—Towanda.

MR. KERRICK: I second this nomination.

MR. SHOEMAKER: I nominate Greensburg, Westmoreland county. We can have the use of the Court House and have good hotel accommodations.

MR. TAYLOR: I second the nomination.

MR. BRONG: I want to name a place which has become famous, not only in this State, but throughout the Eastern United States as a summer resort—Stroudsburg, Monroe county.

DR. BECK: I second it.

The CHAIRMAN: Any other nominations? If not we are ready to entertain a motion to close the nomination.

MR. JOEL A. HERR: I move the nominations close.

This motion was properly seconded and duly carried in the regular way.

MR. KERRICK: A year ago at this time, I think, one of my friends from Lancaster county said to me that he would be glad if we would allow the summer meeting to go to Lancaster without question, and I told him that I was not anxious to make trouble—that a year later would do me very well We went down to Lancaster and had a good meeting and enjoyed it very much.

We also have a good Court House, as the member from Westmoreland has said, and facilities for accommodating you, and some beautiful scenery along the Susquehanna River, near the York State line. We will be very glad to entertain you at Towanda. We make a good deal of dairy butter, and I want to say to you, gentleman, that we make the best butter in the world. The Navy gets all its butter from Troy. We will try to entertain you well, and hope to see you all at Towanda. We will give good butter and buckwheat cakes if you want them.

The SECRETARY: What! in May?

The CHAIRMAN: Any other remarks? If not we will proceed to the selection of a place.

The SECRETARY: I will call the roll, and the members will please answer distinctly, so that we may get the record correctly.

The roll-call showed the following result:

Towanda, twenty-nine; Greensburg, nine, and Stroudsburg one.

MR. SHOEMAKER: I move we make it unanimous for Towanda.

DR. BECK: I second that motion.

This motion was duly carried in the regular way, and Towanda was unanimously selected as the place for the summer meeting.

MR. HUTCHISON: That last report of Prof. Kellogg's, I would just state that the City of Harrisburg is doing a great work in destroying the fly. Mr. Jones' wife, here, is at the head of the movement, and they have offered two premiums, one to the boy and one to the girl, that will kill the greatest number of flies.

The CHAIRMAN: I was just thinking that it might induce them to raise flies instead of killing them.

MR. HUTCHISON: Now, Mr. McFarland is taking a great interest in the matter; and I tell you that farmers should take a lesson from these city people in not allowing their manure and filth to accumulate round the premises. We built a new house six or eight years ago, and we thought we would have no flies; we had our horses near; we didn't know at that time of the connection between flies breeding and manure, and we were over-run with flies, and could not understand how they came there. Now the farmer can help the housewife by simply doing his duty in the removal of the breeding places of these pests. I want to commend the good women of this city for the good work they have been doing under the leadership of Mrs. Jones.

MR. DeWITT: I am from Tioga county. We have a great many creameries and condenseries in that county, and you would be surprised at the carelessness manifested there. Some of us may possibly be clean ourselves, with our stables and our homes, but our neighbors may overdo the matter the other way. It is a curiosity to me to know how to get to work to eradicate it. You may do your part, but if your next door neighbor, not more than fifty or a hundred yards away from you, is so dirty that it is impossible for a man to sit down to eat a meal in the house without being carried away by the flies, how are you going to prevent these flies from coming over to your place? I think there should be some law for the condenseries and creameries if nothing else.

The CHAIRMAN: I think so too, and I think the farmer should be compelled to take his manure out on the field.

A Member: There are flies where there is no horse manure. I live in a small village, and our Town Council constituted themselves a Board of Health, and they make it their business to inspect the back yards several times during the summer, and if there is any place where the flies can breed, the owner receives a very strict notice and he has to pay attention to it. If all communities would do that, we would soon overcome the fly.

The CHAIRMAN: If you go along the city streets, you will notice the garbage pails stand out half the day, uncovered That is where the flies breed, and it is a matter which should receive attention.

MR. GEARHART: The American people, as a rule, are opposed to be compelled to do anything. There are some things that can be enforced, but there are others which I sincerely question, and among them is the point made by the member, of compelling the farmer to haul out his manure at once. There are instances where it is almost impossible to do this. I think the best thing to do is to educate our people, through meetings like these, through the Grange, through bulletins, through the pulpit, if necessary. Teach our people to be cleanly instead of compelling them to be so.

A Member: I am glad to hear these discussions. I think it is a very important topic, and one we should take with us into our homes and look into at once.

The CHAIRMAN: I agree with Brother Gearhart, that it is a matter of education, but so far as spreading the manure is concerned, I have never seen the day when, if I could get up to go to the stable, I could not go to the field too.

The SECRETARY: Put it on with a spreader.

A Member: Would you think it profitable to put it on with the rain?

The CHAIRMAN: I have always done that, and never lost a day because it rained.

A Member: If you went up the Cumberland Valley on a wet day, and then had to let it lie, when it became dry you would see where you found it.

The CHAIRMAN: Perhaps I am talking too much, but I am simply giving you my own experience.

A Member: I agree with the member on what he says about letting the manure lie out in the rain. It is not that a man would care so much for the rain.
As a boy, I was taught that the fly was a scavenger, and carried off the refuse, but I have been taught better. I think that if we can get this matter into our schools, a great deal of good will be done. But a few years ago we couldn't get the teachers, or even the County Superintendent to take any interest in anything pertaining to agriculture. I see they are beginning to teach it now and it is something to be thankful for.

MR. BARNES: I don't know whether any of you have ever tried to get rid of the fly in the way we do on my place As soon as the manure is removed we burn flour of sulphur in the stable and spread lime on the floor, and we are never bothered with flies. We always try to get our manure out, rain or shine.

The SECRETARY: You will have to take care who handles the burning of the flour of sulphur.

MR. BARNES: We do in an iron kettle and take good care not to set anything afire.

The CHAIRMAN: This discussion is very interesting, but we will now have to take up the next subject which is, "Computing Dairy Rations," by Prof. H. E. Van Norman.

Professor H. E. Van Norman spoke as follows:

COMPUTING DAIRY RATIONS

By PROF. H. E. VAN NORMAN, *State College, Pa.*

In taking up the computing of rations, I shall outline my suggestions in new terms—that is new to many of you who have for so many years been discussing the feed problem in terms of protein, carbo-hydrates and fats.

You known Dr. Armsby has been conducting his experiments on the carbroymeter by means of which he measures the power of the food content. For instance, if we have one hundred pounds of coal in our fire machinery, it will turn into steam and this steam is the energy that is required to do work. Our new term is simply measuring the power of the food content by the power to do work. We measure it by the amount of heat it would produce if burned up, but all of the feed is not available for milk production; a part of it is lost. There is a loss of energy in the faeces, in the urine, in the gases, in the labor of chewing, swallowing and digesting the food, what is left is available for milk production and for energy stored for a gain in weight. Therefore I am going to outline to you a method of figuring it in terms of net energy, with the losses all taken out. In the old method only one loss was taken out.

For instance, one hundred pounds of corn meal is given 41 per cent. net; that is 58 per cent. is lost, or required for digestion. When we get to timothy hay, 51 per cent. is required, leaving only 49 per cent. for production, wheat straw, only one-fifth of all the energy available for milk production. That means that corn meal has only four times as much energy as wheat straw. These figures explain why it is that our new standard is a more accurate measure of net energy, than is our old standard.

Now when we come to figure out a ration for the animals, we know from practical experience and experiments that have been performed, that every animal requires a certain amount of energy for her maintainance; that is a dry cow, that is not in calf requires a sufficient amount of food to keep up her strength. That is what we speak of as maintenance, therefore, we must give that cow enough feed to take care of herself. The amount of feed she requires more than that is for the milk she produces. A lot of us have lost money in times gone by, because we didn't feed a cow more than she needed for her own use. To put it in practical terms, suppose she needs six therms (or we can call them units if you wish) of net energy to keep herself, if she is going to produce twenty pounds of milk, she will require another six therms, which is twelve; and if you only feed her nine of them, you cannot expect her to produce twenty pounds of milk In fact, she won't do so. Why? Because you haven't given her strength enough to take care of herself and of her milk.

You can take that milk to the laboratory and find just how much energy there is in that milk. Let me emphasize that statement in this way. The amount of milk a cow gives is measured by her ability to eat food above that required for her maintenance When you go through the country and see a cow running thin, you may be sure she was not fed enough to keep up her energy and produce milk. The dairy cow is primarily a mother, and she makes milk to feed her young. As soon as you see her getting fat, you have proof conclusive that she is getting more feed than she needs to produce milk. There are thousands of farmers in this State who are losing money because they do not feed enough to produce milk There are a few farmers who go to the other extreme. But that is not the only thing we can get energy from; coal produces energy but the cow cannot use coal so we must feed her something that she can eat and digest—something that she likes. So we feed her carbo-hydrates and fats to produce milk. One hundred pounds of milk contains a little less than sixty-four pounds of casein, and casein contains nitrogen which comes only from carbo-hydrates; therefore we must supply protein in sufficient quantities to produce the milk. If a mason begins a foundation without enough brick of any kind, he cannot complete it, because he cannot make mud take the place of brick; but if he needs only one or two bricks, he can make mud take the place of them. You cannot get a good milk production with an insufficient supply of protein. It is true that when a cow is just fresh, in the first month or month and a half of her period of lactation, if you feed her an insufficient supply of the milk producing feeds, nature has constituted her that she will take the fat from her own body and make milk. That is why a cow gets thin after freshening. Dairymen have profited by that. The Missouri Experiment Station have made an experiment on that. They allowed a cow to draw her fat when she was producing twenty-five to thirty pounds of milk. At the end of thirty days she was giving the same amount of milk, but she was only fed the amount required for her maintenance. What was the result? She had drawn on her body to make this milk, and she was so weak that she could hardly stand up, and had to be helped on her feet. That shows how strong is Nature's determination to furnish food for that calf.

Now, after that calf gets to be from six, or eight weeks old, it is presumed to be able to care for itself, and the amount of milk supply decreases unless the cow is given from a half to a pound of protein to take care of herself. She requires six therms of energy to take care of herself. If she is supposed to produce milk she requires six therms more. A thousand pound cow, giving twenty pounds of four per cent. milk, needs twelve therms of energy and one pound of protein. I will not go into details with the figures because we are about to issue a bulletin at the College, which you can get by addressing us, and which will give you all the figures.

It is not possible for me to figure out exactly the ration required for your cow. In the next place, it is not possible for you to guarantee to me that your silo is exactly the same composition as the silage of the bulletin? Now, there is no use quarreling over these small details. There is no use spending a dollars worth of time to get fifty cents worth of exactness on paper. Now, what is required of you is to get a reasonable ration that will give her tne required amount of energy and then feed her in proportion to the amount of milk you expect her to produce.

The next rule: Feed your cow a grain mixture for the purpose of making flesh, and then give her all the roughage she will eat. A good proportion is one pound of grain to each three pounds of milk, or if the grain is high priced and she thrives on roughage make it one pound of grain to each four pounds of milk; anywhere along there is safe; and you can get the most ignorant farm hand to follow this rule and be sure of good results. Our roughages are usually short of protein, so we must mix it with grain and in order to produce twenty pounds of milk a day, we must give the cow from one pound to one pound and a half of protein; so we must make the mixture to cover the difference. If you feed timothy hay, corn stover and silage, you must have a good deal more protein in your mixture than if you are going to feed from clover or alfalfa. The amount of grain will also tell a little the amount of protein there must be in your grain mixture. The more grain you feed the less protein, in proportion to your energy will be required.

Now I divide our roughages up into three grades. The first grade is timothy hay, corn stover and silage; with this you have one pound of protein for every four therms of energy. But if you have for your mixture clover hay and timothy, or clover hay and silage, then the protein is one in five. Of clover hay and alfalfa, you get as high as one in seven or eight; in fact I think you can go so high as to feed simply straight corn meal. In following any of these rules, I have tried to give you simply enough protein to safely expect the cow to do her work. In fact, I think you are giving her more than she needs. It may be a quarter of a pound of protein more than she needs, but it is not as expensive as two or three of the robber cows that most of us have been keeping.

Now when we come to making up a grain mixture, I believe it is advisable to make the mixture of at least three or four different kinds of feeds. We want to stimulate the appetite of the cow, and experiments of the New York Experiment Station show that the animal does best on a variety of feeds. The four things then we want to remember in studying what would be a reasonable ration for the cow are:

(1). Cost of the feed.
(2). Effect on the system of the cow.
(3). Practibility.
(4). Bulk.
(5). Variety.

The relative economy of two feeds is not measured by their cost price, but is measured by the cost at which they furnish the needed energy. The cottonseed meal is to-day almost the highest priced feed per ton on the general market, and yet it is one of the cheapest feeds we buy, because it furnishes a larger amount of the needed energy per dollar than any other feed we buy. Now a lot of you have a mistaken notion that you can pay a low price for some of the cheap hull feeds, but if you divide the cost of one hundred pounds by the therms of energy it furnishes, and the cost of the one hundred pounds of protein by the amount of energy it produces, you will find that the cheap hull feeds are not so cheap after all. I would ask you to use the best feeds you can get; it will pay you. The cheapest feeds are the ones that produce energy the cheapest. That at this present time will be corn meal or corn and cob meal. The feed that will furnish protein the cheapest will be cottonseed meal. Next, it will be gluten, or Ajax or brewery grain. Wheat middlings is one of the cheapest feeds we can buy at the present time in our Middle states. All are good, so we will take the one that has the best effect on the system of the animal. Some animals are individually constipated and some are individually lax. We want to counteract the one by the other. If we don't have any silage or roots, or beet sugar meal feed, we put a little oil meal into the mixture about once a day. If we have any of the other feeds, we do not use the oil meal, because it is expensive. Most animals can be taught to eat anything that is desirable. Boys can't, because they were spoiled in their bringing up. Start small; put in a teaspoonful if necessary, and then bring up the amount. But it is usually desirable to feed them what they want, if it doesn't cost too much.

Next, comes bulk. The cow's machinery is usually built to hold a large amount of feed. But we can overdo it; a cow cannot eat all clover hay and do her best work, therefore we want that bulk composed of something that will increase her energy. I would mix with the hay, some corn and cob meal or distillers' grain, or gluten. If you have to use only heavy feeds, I would chop some of the hay.

Next, comes variety; I don't know how important this is, but most of our men who do experimenting believe that cows work better when they get a good variety of feed; and from the results of these experiments, I believe that this is true.

Now, the next point that I would make is, that in making up a grain mixture we get down to an actual method of work. If that cow is to be of much profit, you want to get that energy as cheap as possible. We take one hundred pounds of protein, as a basis, and to this we add the amount of cottonseed meal you think should be used; then the amount of gluten feed; then add this up and divide the possible protein into the possible energy. If it comes out right you get a mixture from that standpoint. If not, you can add to it until the sum total of the protein divided into the sum total of the energy gives he right total, and you can work according to this rule, no matter whether you mix twenty-five pounds, or fifty pounds, or one hundred pounds, or two hundred pounds, or three hundred pounds you will find it simplifies wonderfully the mixing of the rations.

Another thing that our bulletin will contain is totals in which we have dropped the decimals. Now, if you will take the trouble to compare you will see that cottonseed meal has 84.23 therms of energy, and 10.27-28 of protein. Now I have figured that in making mixtures of this kind, it will simplify matters to drop the decimal, and use only the whole numbers, the small amount contained in the decimal will not matter. Again I am recommending that we use one hundred pounds value instead of fifty or twenty-five pound values; however, you will find a table in which I have given the protein and energy in connection with twenty-five, one hundred, two hundred, and three hundred pounds you can make up almost any kind of a total and figure the amount of protein. Now to give you a sample list, which I have figured up here:

RATIO OF PROTEIN TO NET ENERGY FOR DIFFERENT ROUGHAGES, QUALITIES AND QUANTITIES OF MILK

When roughage is	When feeding one pound of grain for each four pounds of milk per day	When feeding one pound of grain for each three pounds of milk per day
GROUP I Consisting of Timothy Hay or Corn Silage or Corn Stover or any two or three of them, make a mixture.	For cows producing less than 15 lbs. of milk per day, make a mixture containing 1:3.5 of net energy. If producing over 15 lbs. milk per day, make a mixture containing 1:4 of net energy.	For cows producing less than 20 lbs. of milk per day, make a mixture containing 1:4.5 of net energy. If producing over 20 lbs. milk per day, make a mixture containing 1:5 of net energy.
GROUP II When in addition to silage or fodder, 5 to 7 lbs. of clover or alfalfa are fed, or when mixed hay is half clover.	For cows producing milk testing 3 to 3.5% fat, Protein 1 to 5 net energy. For cows producing milk testing 3.5 to 4.5% fat, Protein 1 to 5.5 net energy. For cows producing milk testing over 4.5% fat, Protein 1 to 6 net energy.	For cows producing milk testing 3 to 3.5% fat, Protein 1 to 5 net energy. For cows producing milk testing 3.5 to 4.5% fat, Protein 1 to 6 net energy. For cows producing milk testing over 4.5% fat, Protein 1 to 6 net energy.
GOUP III When all the rougage is clover or alfalfa hay.	For cows producing milk testing 3 to 3.5% fat, Protein 1 to 6 net energy. For cows producing milk testing 3.5 to 4.5% fat, Protein 1 to 6.5 net energy. For cows producing milk testing over 4.5% fat, Protein 1 to 8 net energy.	For cows producing milk testing 3 to 3.5% fat, Protein 1 to 6 net energy. For cows producing milk testing 3.5 to 4.5% fat, Protein 1 to 7 net energy. For cows producing milk testing over 4.5% fat, Protein 1 to 8 net energy.

THE RELATIVE NET ENERGY IN CORN MEAL, TIMOTHY HAY AND WHEAT STRAW

Total Energy	Lost in feaces	Lost in gas	Lost in urine	Lost in labor	Total loss	Net energy
%						
100 Corn meal,	9.2	9.3	3.9	36.3	58.7	41.3
100 Timothy hay,	48.9	3.8	3.1	29.5	85.3	14.7
100 Wheat straw,	54.8	9.0	2.5	27.7	94.0	6.0

TABLE III—MAINTENANCE RATIONS FOR COWS

	Pounds digestible prot.	Therms net energy
750 lb. cow requires for maintenance about,	.4	4.95
1000 lb. cow requires for maintenance about,	.5	6.00
1250 lb. cow requires for maintenance about,	.6	7.00
1500 lb. cow requires for maintenance about,	.65	7.90

TABLE IV—REQUIREMENT FOR MILK PRODUCTION IN ADDITION TO MAINTENANCE

	3% Milk		4% Milk		5% Milk	
	Protein	Energy	Protein	**Energy**	Protein	Energy
For 1 lb. milk,	.045	.22	.05	.30	.055	.39
For 10 lb. milk,	.450	2.20	.50	3.0	.55	3.9
For 15 lb. milk,	.675	3.30	.75	4.5	.825	5.58
For 20 lb. milk,	.900	4.40	1.00	6.0	1.10	7.8
For 25 lb. milk,	1.125	5.50	1.25	7.5	1.375	9.7
For 30 lb. milk,	1.35	6.60	1.50	9.0	1.65	11.7

Ration 196	Protein	Therms energy
175 lb. Corn and cob meal,	7.	126.
100 lb. Cottonseed meal,	35.	84.
100 lb. Distillers' grains,	22.	79.
100 lb. Linseed meal,	29.	75.
475 lb. Contains,	93.	364.
1 lb. Contains,	.195	.766
Ration 107		
200 lb. Corn and cob meal,	9.	144.
150 lb. Cottonseed meal,	52.5	126.
175 lb. Distillers' grains,	38.5	139.
100 lb. Gluten feed,	20.	79.
625 lb. Contains,	120.0	488.
1 lb. Contains,	.192	.780

		Protein and Net Energy in					Price per ton	Price 100 lb.	Cost 100 lb. protein	Cost 100 T. energy
		25 lb.	50 lb.	100 lb.	200 lb.	300 lb.				
Ajax Flakes,	P	5.5	11.	22.	44.	66.				
	E	20.	40.	79.	158.	237.				
Barley,	P	2.	4.	8.	17.	25.				
	E	20.	40.	81.	161.	242.				
Brewers' Grains, dry,	P	6.	9.5	19.	38.	57.				
	E	20.	30.	60.	120.	180.				
Brewers' Grains, wet,	P	.9	1.9	4.	8.	11.				
	E	3.7	7.5	15.	30.	44.				
Beet Pulp,	P	1.7	3.5	7.	14.	20.				
	E	15.	30.	60.	120.	180.				
Buckwheat Mid.,	P	5.5	11.	22.	45.	67.				
	E	19.	38.	76.	152.	228.				
Corn,	P	1.7	3.5	7.	14.	20.				
	E	22.	44.	89.	177.	266.				
Corn and Cob Meal,	P	1.	2.	4.	9.	13.				
	E	18.	36.	72.	144.	216.				
Corn Hearts,	P	3.5	7.	14.	28.	43.				
	E	21.	42.	84.	168.	252.				
Cottonseed Meal,	P	9.	17.5	35.	70.	105.				
	E	21.	42.	84.	168.	253.				
Distillers' Grains, Corn,	P	5.4	11.	22.	44.	66.				
	E	20.	40.	79.	158.	237.				
Distillers' Grains, Rye,	P	2.5	5.	10.	21,	31.				
	E	15.	30.	61.	122.	183.				
Gluten Feed,	P	5.	10.	20.	40.	60.				
	E	19.	39.	79.	142.	237.				

Gluten Meal, Chi.,	P	8.	16.5	33.	66.	99.				
	E	20.	39.	78.	157.	235.				
Hominy,	P	2.	3.5	7.	14.	21.				
	E	21.	42.	84.	168.	252.				
O. P.,	P	7.	14.	27.	55.	83.				
Linseed Meal,	E	20.	39.	79.	158.	237.				
N. P.,	P	7.	15.	29.	58.	88.				
Linseed Meal,	E	19.	37.	75.	149.	231.				
Malt Sprouts,	P	3.	6.	12.	25.	37.				
	E	11.5	23.	46.	93.	139.				
Oats, ground,	P	2.	4.	8.	17.	25.				
	E	16.5	33.	66.	132.	199.				
Sucrene,	P	.8	2.	3.	7.	10.				
	E	14.	29.	37.5	115.	173.				
Unicorn,	P	5.	10.	20.	40.	60.				
	E	19.	38.	76.	152.	228.				
Union Grains,	P	4.	9.	18.	35.	53.				
	E	18.	36.	71.	143.	214.				
Wheat Bran,	P	2.	5.	10.	20.	31.				
	E	12.	24.	48.	96.	145.				
Wheat Mids.,	P	3.	6.	13.	25.	38.				
	E	19.	39.	72.	155.	233.				

A Member: With one hundred pounds of union grains, how much cottonseed meal would it take to make up the required number of therms—in union grain there is about 27 per cent. of protein.

PROF. VAN NORMAN: I think it would be one hundred to three or four hundred. The following is a mixture which would go well with timothy hay and corn stover.

400 pounds of corn meal.
100 pounds of cottonseed meal.
300 pounds of distillers' grain.
100 pounds of gluten feed.

Now that amount of grain would contain 7.44 therms of energy. If you want to find out whether it is a cheap ration or not, figure out what it would cost you at your price, and divide by 7.44 to get the cost of the energy, because that amount of grain contains 7.44 therms of net energy. At the present market price of grain, you should be able to furnish the necessary amount of protein at less than two dollars, our's costs one dollar and seventy-nine cents, buying in carload lots, as we have been able to do. Now that is protein, 1 to 5 per cent. net energy.

Now I will give you over two other mixtures, which you may like to figure out. Here is a mixture which I believe can be fed profitably at the present prices, but there are many of our farmers who have to figure on their own home grown products; they want to figure linseed meal, because it is low in price, and corn meal and oats, and bran, because they have them.

300 pounds corn meal.
300 pounds linseed meal.
200 pounds oats.
400 pounds bran.

This contains 8.14 therms of energy; divide the cost by 8.14, and it gives you the cost of the feed to you—not the cost of the energy—and I think you will find it runs somewhere near 2.15 per hundred as compared with 1.85 for the other.

In making up your grain mixture, spread on the barn floor, first the bulky feeds; put on top of these the next lightest and so on, with the heaviest on the top, then spread it as a good cement mixer spreads his cement; then take up a shovelfull and lift it clear off the floor and throw it over to the right or left, and then throw on the next shovelful, spreading it as you go, and mixing it, and then throwing it back again into the middle of the floor in the same way; at the end of the third handling it should be properly mixed.

Now it is usually no trouble to weigh the feed; if not every day, I believe it is wise to weigh it once a week at least. If she gives eighteen pounds of milk, she should have three pounds to eat. Mark the amount on the stall, if you don't care to weigh it up each time get a measure that will hold the proper amount. The greatest need of our farming is business methods.

The last five years have been years of science and bacteria, the next ten years are to be years of business and profit. We must get down to figures. If you only sell two hundred dollars worth of business off your farm, you cannot have two hundred dollars worth of profit. Study your profits, or don't do business.

The next step will be the science of feeding—the study of economy in feeding. Find out what your cows are doing, and don't buy forty dollars worth of feed for a cow that only gives thirty-five dollars worth of milk.

The CHAIRMAN: What is the pleasure of the meeting concerning this most splendid report?

MR. HUTCHISON: I move it be received and published with the proceedings.

This motion was properly seconded and duly carried in the regular way.

The SECRETARY: Now, Mr. Chairman, if there is any discussion on this subject or any questions to ask Prof. Van Norman, now is the time, and I would suggest that we devote a little time to the discussion.

MR. GEARHART: I would like to ask a question in regard to the value of the protein in corn. During the fall of this year, I was feeding my cattle a good second crop of clover hay with about seventy-five pounds of corn and cob meal and about one hundred and thirty-five pounds of dried brewers' grains—mostly barley—prior to that I had been feeding about the same ration of cob, corn, gluten and clover hay. I used the new mixture pound for pound, but the cows appeared to fall off in milk so I substituted wheat bran for the dried brewers' grain and they soon picked up again. Now the analysis of this dried brewers' grain gives 26 per cent. of protein, while wheat bran is only given as about 16 per cent. Now can you explain why this was so?

PROF. VAN NORMAN: Well, there are other factors than those I have spoken of that enter into this feeding problem. It seems that some feeds stimulate digestion. Then, again the figures as you get them from the mill are the total protein, and you have no deduction for digestion, while here you have the four losses and some of the figures are very different when you get them with all the losses deducted. Without actually seeing your feed I don't know that I can answer your question more exactly.

MR. GEARHART: But you do think that the analysis as given is not always correct?

PROF. VAN NORMAN: Yes; or it may be that your totals are not always correct. They may be higher or lower.

MR. J. ALDUS HERR: In Lancaster, we are corn growers and to a great extent, we know that unless we feed a considerable proportion of corn during the growing period of the corn, we will not get the best results. If we feed more of the by-products, such as brewers' grain, with our silage, nearly always the cows lose in flesh. We can't very well get away from the corn in spite of the fact that we are apt to go to the other extreme and feed too much corn.

PROF. VAN NORMAN: Now when you go to feeding corn, the first result possible in feeding high protein feed is that you feed more protein than necessary, and the best condition of our cows is not produced by feeding an excess of protein.

A Member: What will be the number of your bulletin?

PROF. VAN NORMAN: I can't tell you yet. I have just handed the manuscript to the printer, and you will simply write for the bulletin on feeding, and it will be sent you.

MR. GEARHART: One more question. I have found gluten feed to be one of the best milk producers, but there is an acid about it that I would like to know whether it is injurious to the cattle?

PROF. VAN NORMAN: The Geneva Experiment Station has done work on the acidity of gluten feeds, and while there is an excess of acid generally, I think the probability is that the danger is very small, and the thousands and thousands of tons used without injurious results, would seem to bear out the statement I make that it is not injurious; and then again, it is only one out of four mixtures.

MR. GEARHART: My experience has been that the more variety the better.

PROF. VAN NORMAN: Some of our best feeders have gone as high as six or seven.

MR. J. ALDUS HERR: In line with the general question, some of us in Lancaster county found the results from some of these gluten grains were not satisfactory, and we sent them in for analysis. We found some acid, but we were not able to tell whether it was the result of this or not, so we tried an experiment.

We arranged with the State Livestock Sanitary Board to feed this feed exclusively to some of the cattle in their Veterinary Department at Philadelphia, and they reported to us that it would do no harm.

MR. HUTCHISON: In this case the Veterinarian said that it is just possible that these cows died of this acid. Five of these cows died in that county, and yet the cows to which it was fed as an experiment all thrived on it. There is acid in small amounts in all feeds, but an investigation made in the laboratory by our chemist, who was here this morning and who has made a number of tests, shows that they do no harm.

We had with us here yesterday a man who was interested in beet pulp, and he claims that it puts the stomach in shape for the other feeds to work on. It was a new statement to me, but it sounds plausible after what has come out in this discussion.

PROF. VAN NORMAN: This beet pulp has some value in these analyses; it seems to stimulate, I look at it in this way: The cow eats to satisfy her appetite in proportion to the feed she eats. If you go out and work very hard, you eat a great big meal as the result of your exertion, but if you have done nothing for four or five days, you cannot eat a big meal, if you know you are going to have a big lot of work, you eat in order to store up all the energy for doing the work. Now the statement is made that the cows eats to supply her internal demand for food, and it seems as though beet pulp helps to stimulate this demand.

Now you should know that you can eat crackers, but it will be hard to keep you going. If you don't believe it, you get three good sized crackers and try to eat them dry in a minute and a half. If you put on a little butter, or eat an apple with them, it will be all right. But it is not only a question of feed; it is something more. Now, the rules I have outlined, each man can follow as his judgment dictates.

The CHAIRMAN: What effect has molasses on the cow?

PROF. VAN NORMAN: It seems to be an appetizer and a laxative. The cow can sometimes be made to eat hay which she would not otherwise eat, but I do not think it has any food value and it is largely being dropped on that account.

The SECRETARY: I am afraid, Mr. Chairman, we will have to move on to the next subject. These discussions are very interesting—particularly the last remarks about the beet pulp, which is something new to most of us.

The CHAIRMAN: We will now take up the next number on the program, "Ear-Marks of the Farm," by S. C. George.

Mr. George's paper is as follows:

EAR-MARKS OF THE FARM

By S. C. GEORGE, *West Lebanon, Pa.*

It is not my intention in this paper to try to instruct such an intelligent audience as this, yet we would consider our time and efforts wasted did not some one gather some thought from it that would be of use to him, for we know that it is he who has knowledge who thirst for more.

In choosing our subject we were guided partly by an article in the "National Stockman and Farmer" from the pen of W. D. Zinn in which he said, "That good farming had certan ear-marks that could not be mistaken." While this is true, poor farming also has its ear-marks, that are equally easily discernible, and as straws indicate which way the wind blows, so there are certain marks that point to good or poor farming.

We should emulate the good farmer; we should strive to learn all we can from him; his methods, his operation, and his achievements. But we can also learn a great deal from the poor farmer by avoiding his failures, noting his carelessness and his mistakes.

WHAT ARE SOME OF THE EARMARKS OF THE FARM?

When we see the buildings in good repair, the machinery carefully put away when not in use, the fences neatly built, fence-rows trimmed with care, a good sod on the fields, the growing crops thrifty, the manure hauled out on the fields at the right time, the animals sleek and in good condition, we known that the owner or caretaker of that farm is a good farmer, and one whom we can safely pattern after.

But on the other hand when we see dilapidated buildings, buildings not old but out of repair and neglected, where paint has not been used, where doors are off their hinges, gates hanging by one hinge, or perchance lying on the ground, where the boards are loose on the fences, fence-rows grown up with briers, elders and bushes of all kinds that you could not plow within a rod of the fence, fields covered with weeds, golden-rod, aster, wild carrot, daisy, and thistles instead of grass, the machinery standing in the field where it was last used or in a fence-corner, or under an apple tree, the fowls roosting on the trees, the cattle looking as if they had the "hollow horn" or "wolf-in-tail," had lost their cud and not enough in their stomach to make a new one; then we see some of the marks of the poor farmer.

Have you ever noticed in traveling along the highways or in the railway car the differences in farms? Even if there be no fences you can easily discern farm lines by the different appearance in the farms. Or, if there be fences, one man will have his side clean up to the fence, while the other side cannot be reached by several rods. And this only makes work harder for the man who strives to keep his farm clean; where a spinster owns a farm on the west of you and a so-called city farmer owns one to the northwest, where weeds are left to grow unmolested, to ripen and be blown by the wind or carried by birds, it is a difficult problem and it is only by persistent efforts that one can succeed.

And while it is not our purpose in this paper to tell how to do things, yet right here we would say that the use of the mowing machine, the scythe, the brier hook or the mattock at the right time is one means by which we surmount many difficulties and where our work, on the farm, will show to good advantage.

But you do not need to go to the farm to distinguish between the careful and the careless farmer. Meet him on the road with his team, go to the market place, the mill, the coal mine, the railway station, or wherever farmers congregate with their teams, and note the difference, and you will have an ear-mark of what you are likely to find on the farm. One with a broken spring on his wagon seat propped up by a piece of plank, the wagon bed so badly broken that it would hardly hold pumpkins, the harness tied up with binder twine or baling wire, and you may be sure to find similiar conditions on the farm, where no modern methods are used; a man who says Farmers' Institutes are a farce and that farm papers are fit only for kindling wood.

But on the other hand you notice different conditions; the harness kept well oiled, broken places and nuts kept tight about the wagon, the harness good, and the horses neatly groomed, and you draw different conclusions. You are sure on that farm to find a man who takes time solving the problems that arise on the farm, one who uses all the means to advance the productive powers of the arm.

We can also learn a lesson in economy right here, for while it is necessary to be neat and careful, we do not need to be extravagant. And how often do we see a team loaded with rings and regalia simply to try to outdo one's neighbor! It is a pretty guess, that in the house the good wife is struggling for some needed article of necessity.

WHAT IS THE TRUE AIM OF FARMING?

Is it to buy more land, to raise more corn, to raise more hogs, etc., etc., ad infinitum? What should be the object of any man's life? If it is not to enjoy the fruit of his labor?

The home is one of the ear-marks of the farm that is too often overlooked. The home should be attractive. In our great cities where and is dear, houses have to be built on small areas and into the air; but this is not necessary in the country. It may have the comforts of a city house without looking like one. The tasteful home has a sale value in the country as well as in the city. It adds value to the farm as well as enriching the soil to make it more productive, yet this is a wealth that cannot be counted in dollars and cents.

The conveniences in the home are marks of distinction. The fuel and the water are of great importance, especially the latter. How often the water has to be carried up steps or from a far-away spring, or pumped out in the cold, when for a few dollars the water could be had in the house.

"Its great to be a farmers' wife,
  And live upon the farm
And rise up early in the day,
  To make fires bright and warm,
That the farmer man has kindled
  For his faithful loving one,
Who now prepares the breakfast
  And thinks it first class fun.

"It's great to be a farmers' wife,
  And breathe the country air,
To raise the chicks and gather eggs
  And sell for prices fair.
The children love their mother,
  And the father loves her too;
And to keep her kingdom moving
  Is all she has to do."

CO-OPERATION OF HOME AND FARM

Co-operation in the home and on the farm is one of the essential factors in success and happiness. It is just as necessary here as in a business firm. The wife and children should feel that they are members of the firm, and not merely boarders. It is not always necessary that such services shall be paid in money, but oh! there are so many ways of rewarding where money could never pay the debt.

"Little deeds of kindness,
Little words of love."

When such conditions exist there are no suits in our divorce courts, and the boys and girls are not in a hurry to leave the farm.

There are farmers who sell everything off the farm that will sell, or the best of everything, keeping for himself only that which is not marketable. Is this wise? Is it good farming? The farmer's table should be supplied with the best of everything; not necessarily expensive, but plenty of fresh, wholesome food. The farm will furnish the fruits, the vegetables, the milk, the butter, the eggs, the meat, with little labor if proper means are used. When these things sell high in the market, the farmers are tempted to sell, but he can afford to do so only when the supply is greater than the demand at home.

One of the ear-marks of the farm that cannot be denied, is the reading-table in the home. Let me go into the home and look at the literature, and I will tell you what kind of a family it is. This is a day of reading. It is not enough for a man to have brawn and muscle, but he must have brain. In this day of agricultural schools, experiment stations, farmers institutes, and with the writing in our farm papers of such men as Agee, Zinn, Chamberlain, Lighty and a score of others, there is no reason for a man not to be educated. Allow me to repeat, then that whatever may be the other conditions of life the home should fill the first place. In fact you never know a man till you see him at home.

Good business is a mark of the farmer. How often in the transaction of our affairs do we use no business ability. The farmer should be a business man, and the farm will soon show the results. He should keep informed as to prices, know when to sell to best advantage, to buy and sell in a business way. Method is another feature that is lacked by many farmers. Doing our work in a careless way and its results are soon seen. But have these ear-marks a value? They surely have. The manufacturer or the dealer has a trade-mark on his wares or his goods which sells them. So should the farmer have; the mark is bound to be there and if he does not put on one of which he is proud, the other kind will put itself there. If your trade-mark is right, when you have anything to sell whether it be an animal, grain, hay, fruit, vegetables, butter or eggs, an "ad" in the paper is enough to bring you buyers in abundance, but if the goods be such that you are ashamed to put a trade-mark on them there is a poor market for your produce. Fellow-farmers what kind of ear-marks are on your farms?

The CHAIRMAN: What shall be done with this excellent paper?

On motion, properly seconded and duly carried in the regular way, the paper was received to be published with the proceedings.

The CHAIRMAN: Is there any discussion? If not we will proceed with the other business.

A paper was handed to me to announce that the report of the Ornithologist at 1.30 this P. M. will be illustrated.

Are there any Committees to report?

MR. J. ALDUS HERR: The Legislative Committee met in Mr. Martin's office, and mapped out a line of work for us to do and make a report at the meeting in Towanda.

The SECRETARY: It will be necessary to call this a Special Legislative Committee, because there is a standing Legislative Committee. It will be so entered on the record.

The CHAIRMAN: Any further business before the house?

The SECRETARY: It may be that some one will want to make a few remarks.

MR. J. ALDUS HERR: Last evening when Dr. Conard made his report on the dairy interest, it struck me that there is one side of the dairy interest, that has been neglected, and that is the education of the consumer as well as the producer. Two years ago there was a meeting called at Lancaster to get better milk for Lancaster city; and as I understand it, after the inspector had been over the county, there was not one sample of milk or cream found that was deficient. Now we have in the neighborhood of one hundred men selling milk, in Lancaster, from six cents up. There is one man receiving milk from two herds, who gets ten cents. For this same milk sold in Lancaster at from six to ten cents, the producer doesn't get over three cents. Now the point I am going to make is, that the retailer doesn't know the difference between milk that sells at six cents and that which sells at ten cents. Would it not be well to educate the public? We see bottles and cans of milk setting on the step until noon, and then the producer is held responsible. I think the public should be educated as well as the producer.

PROF. VAN NORMAN: There is another side to that; Dr. Whitaker, of Washington, in his illustrated report at Pittsburg, showed that a piece of bread and five cents worth of skim-milk furnished more nourishment than some of the higher qualities at ten cents. In this day of high cost of living, that is somethng worth knowing.

The SECRETARY: And the relative value of cheese and beef steak—can Prof. Van Norman give us the figures?

PROF. VAN NORMAN: I cannot, offhand.

MR. HUTCHISON: You wouldn't want to live on cheese all the time.

The SECRETARY: I want a variety, such as cattle get.

PROF. VAN NORMAN: You know that in Europe the people live on a piece of cheese and rye bread and will do hard work on it—an evidence that it is not only cheap, but nourishing. There is more norishment in ten cents worth of cheese, than in ten cents worth of meat.

The CHAIRMAN: I don't doubt that. We are all eating too much meat.

MR. HUTCHISON: There are some people you could feed all the meat on earth, and they wouldn't get fat. It is the individual you have to suit.

The SECRETARY: You know in the development of the human race, the further you go in civilization, the more varied the diet is.

MR. J. ALDUS HERR: I am a little interested in the dairy end of it. We want to conform to our pure food laws as near as we can, but will you please tell me why you go to a hotel and can get only skim-milk for your coffee? You don't get milk even if you are paying for it, and when you produce Jersey milk yourself, it is a little hard on you.

PROF. VAN NORMAN: The same reason they are investigating the Steel Trust today, somebody is getting too much profit.

MR. J. ALDUS HERR: I want to cite an instance, in my own home town, where I sometimes take my meals. I know skim-milk produced in Lancaster county that is better than the cream served at that hotel.

The CHAIRMAN: I think probably they do it for your good, because Prof. Van Norman says there is more nourishment in skim-milk than there is in cream.

DISCUSSION ON GAME LAWS

MR. WEIMER: There is a question I would like to present to the audience, that has not been touched upon, and that is, the Game Laws. I present it as President of the Lebanon County Game Protection Society, and also as a farmer, that is, that a license law should be gotten up which requires a license tag to be placed on the back of the gunners, the same as on the auto. (Laughter). Now, that is all right to laugh at, but these gunners go over your land, and shoot at you, and everything else they see, and how are you going to arrest them? On my farm I'm trying to preserve some Oregon quail; and I have had this experience on my farm. They shot at the quail and scattered them, and shot at me, too. Under present conditions a man, or even a boy, can buy a gun for two and a half to three dollars, they have no experience in handling the gun and they do a lot of damage. Now, what harm would it do to have them wear a nice little tag with a number on it and have a record kept by the Secretary of the Game Commission, so that the gunner could be identified without any trouble? I don't think the farmer should rest satisfied with a license law that does not protect him as it should.

DR. BECK: I heartily agree with the gentleman who made the remarks. To those of you who do not live near a large city it is not much trouble, but to those of us, whose farms are, like mine is, near a large city, it is almost impossible to protect one's self. I have seen as high as thirty men and boys on my land in one day. They shoot at everything—at the chickens in the barnyard, at the cattle, even at my farmers' wife; and I favor the license.

MR. GEORGE: In talking about shooting at everything, a few years ago I was unloading a lot of corn in my own crib, and I heard a rabbit run and hide under the crib, and looking about, I found half a dozen gunners shooting all around the crib, the shots struck all around me and I don't know how I escaped. I am heartily in sympathy with the gentleman who made the suggestion. I think there should be some means by which these reckless gunners could be identified.

MR. HUTCHISON: I am opposed to the Hunters' License. I
n't believe in any American man or boy getting a license for one
two days' hunting. I don't hunt myself, but I should hate to lay
ything in the way of the poor laborer who wants to hunt for a day
two, and I hope there will never be a law of this kind passed in
is Commonwealth. I have a farm of three hundred acres with
od shooting. Some friends of Dr. Beck's from Altoona came there
d enjoyed themselves very much. I hope never to see this law
on the records. If a boy comes out and shoots a turkey or a
icken, it will not do any great harm. If it were not for the labor-
g people, who would consume what we raise? The City of Altoona
the best market in the world, right near where Dr. Beck lives.
hy, when a boy goes out in the woods and shoots something, he
ows a head taller right away. Let him have his day or two of
easure. The laboring man is the man who takes what we pro-
ce.

MR. J. ALDUS HERR: The trouble is, that when the citizens
the town go out to hunt, they don't take their common sense with
em. We have a herd of cattle, and I don't pretend to hunt. Three
four years ago, I had four or five persons come out to hunt, one
as an Ex-Postmaster, and one an Alderman, and they shot all over
erything and scared the cattle into a stampede. When these city
ople come out, they seem to leave their common sense at home,
d they shoot at every thing they see, and run wild; they go into
e orchard and into the truck-patch and even shoot all over the
use. Two years ago my tenant's wife was so badly frightened
at she had to have a physician. It is not so much a matter of
e tag, if they would simply bring their common sense with them,
t they don't.

DR. CONARD: I would like to cite a case that occurred in Ken-
ett Square in Chester county, this fall. These were not prevent-
ble dangers to people, but, they were things that would not have
appened if the boys had been at home, where they should have
een. Game was scarce, so they began to shoot at everything in
ght, and finally they went down along the river, out of sight of the
ouse, where the cows were grazing and shot at them. One of the
ws was hit in the head; she didn't die at once, but she was so
adly injured that it caused her death a few days afterward. I
amined the skull and found it to be a clear case of shooting, that
ould have been prevented by a license. They knew pretty nearly
ho did it, because they knew the character of the boys.

A Member: Right near my place a few years ago, some hunters
ew the whole top of my neighbor's head off.

DR. BECK: The circumstances are entirely different. Mr. Hutchi-
n and I usually agree, but in this case we cannot agree. We have
tremendous foreign population, and it is that class of people who
re doing this shooting and making this trouble. Now this season
veteran of the Civil War, from Altoona was out hunting, and some
oys shot him in the face, and ran off and left him lie there, until
me hunters came along and found him and sent him to the hospi-

tal, where I think he is lingering yet. These boys who are not hunters, will shoot at anything they see and then run off. I think farmers are very foolish not to take some measures to protect themselves.

MR. JOEL A. HERR: I live pretty close to the mountain side, and it is a great place for hunters. In cleaning up our land, we pile up the stones, and we have some pretty large stone piles in our neighborhood, and if a rabbit goes under one of them, the hunters will work for hours to tear it down, but will not spend a minute in putting it back again, and I have worked for days, putting them back again. Now, I don't think a man should be required to have a license to shoot on his own land, but I do think something ought to be done to protect the farm from the depredations of these irresponsible hunters, who are often so under the influence of liquor that they don't know what they are doing.

PROF. SURFACE: It is not generally known, but it should be known, that it is illegal to take a rabbit from a stone pile or wood pile, such as Mr. Herr designates. I started out last fall, putting up post piles, and rail piles, but the hunters came along and tore them down and committed depredations of various kinds, until I have come to the conclusion that a man is justified in not permitting any hunting on his premises.

The suggestion of my friend, Ex-Mayor Weimer, of Lebanon, who is also President of the Lebanon County Agricultural and Horticultural Association, of compelling the hunter to wear a license tag, is a good one. Most of us are not concerned about the law against stealing, but there are people who are. It is not the responsible person who goes hunting on our premises against whom we must protect ourselves, but it is against the reckless ones who commit all kinds of depredations. Under present conditions, even if the hunter can produce his license, often there is no officer near to make the arrest, in cases where it should be done, and by the time the farmer takes half an hour or an hour to go and find the constable, the offender will be gone before he gets back, and there is no means of identifying him, once he is out of sight. With a license tag there would be no difficulty in tracing him, and the farmer should be so authorized to make the arrest himself.

MR. FENSTERMAKER: We have had the same experience in Lehigh county. Mr. Hutchison has the poetical sense. As Mr. Herr has said, instead of carrying their common sense with them, they carry "corn juice," and they are not all foreigners, either. They shoot down whole apple trees and other things.

MR. KAHLER: I don't want to take up too much time. I have seen a good many depredations, and I merely want to say that I want to be recorded in favor of a license tag.

The SECRETARY: When the gentleman over here spoke of a tag, a good many laughed; but the thought came to me that there are a good many men here today who way back in the '60's, carried a big tag on their backs, and it didn't hurt them. If we were found away from our regiment, we were told pretty quickly where we belonged and sent back, unless we could give some good reason for being away. There is no disgrace in wearing a tag.

MR. GEARHART: I have attended this meeting for several years, and I am surprised at the change of sentiment that has occurred. I believe that if a vote were taken, three-fourths of us would vote in favor of the license tag. I, too, know from experience what damage these irresponsible hunters can do. My wife was pretty nearly shot by a boy, for a rabbit, while hanging out clothes. Then they tore up my stone pile and I could not find time to build it up again until the next spring. It does no good to order them off your premises; they won't go. I believe that the license should be so made that every careless boy can't secure it; but I believe the farmer and his family should have the privilege of shooting on his own land without a license.

MR. BOND: I'd like to see the man or boy that would not get off my land when I told him to go.

The SECRETARY: You would have him "Bond-ed?"

MR. TAYLOR: I wish to place myself on record. In the Western part of the State, we have a great many coal mines and we cannot make these foreigners understand when we try to talk to them, and when they come out hunting, they are not themselves. I wish to place myself on record in favor of the license tag.

The CHAIRMAN: I think this would be a matter for the Legislative Committee.

The SECRETARY: The Executive Committee is ready to report, and as it will take but a minute, and some of you will not be here this afternoon, I think we had better take the time now for this report.

The Executive Committee reported the following appointments of Standing Committees and Consulting Specialists of the Board: (See page 7).

MR. HUTCHISON: I move this report be accepted.

This motion was properly seconded and duly carried in the regular way.

MR. JOEL A. HERR: I move we adjourn until this afternoon.

This motion was properly seconded and duly carried in the regular way.

Harrisburg, Pa., Thursday, Jan. 25, 1912, 1.30 P. M.

Mr. Eschbach in the Chair.

The CHAIRMAN: The meeting will please come to order. I cannot help but speak of it at this point. In my opinion this is one of the best and most instructive meetings of the State Board of Agriculture which I have attended in twelve years. Every paper was complete and to the point, and I think that we can congratulate ourselves that we have such an able and efficient body of men to speak to us.

The first number on the program is the Report of the Ornithologist, by Prof. H. A. Surface. Are you ready, Prof. Surface?

PROF. SURFACE: The lantern was taken away at noon; I suppose they didn't know that my report is to be illustrated; my assistant is now getting the lantern ready, and I shall be pleased to have one of the other speakers exchange with me. I have no doubt that Prof. Klinger, the Apiarist, will be willing to do so.

The CHAIRMAN: We will then take up the Report of Prof. Klinger at this time.

Professor Klinger made the following report:

REPORT OF THE APIARIST

By H. C. KLINGER

The year 1911 will pass into apicultural history as one of poorest for the production of honey. Reports have been received from several parts of the State where a small crop was obtained but the general report was "an entire failure." This State is not exceptional in reports of poor crops for this year, since there seems to be a general failure over all the United States and Canada. The failure in this State at least is due to the severe droughts which prevailed the last three years preventing a growth of honey-bearing plants, among which especially was the white clover. The outlook for next year is more promising. The heavy fall rains has started an abundant growth of flowering vegetation, and thus far it was protected by snow, provided the unusually severe winter has not proved disastrous.

The great problems in keeping bees, which men have been trying to solve for years, are apparently unsolved conclusively and still form the subjects of intense study and research. Conditions of weather and climate, sources of honey, manipulation, and numerous other matters enter into making a success or failure possible.

The wintering of colonies has undergone a change. It was formerly thought that all colonies north of 41° of latitude should be wintered in the cellar; but practice has changed so that colonies as far north as Canada are successfully wintered on their summer stands. A crop of honey frequently depends on successful wintering. A colony should go into winter quarters with plenty of young bees and to insure this brood-rearing should go on late in the season. This may necessitate stimulative feeding in the fall after the main honey flow is over. The amount of winter stores depends on the method of wintering and the length of the winter? Cellar wintering requires less stores than outdoor wintering since there is a smaller consumption of food necessary to keep up the temperature of the hive, but it requires greater care in keeping up an even temperature of the cellar and is, therefore, more desirable for the experienced and those of leisure.

Every colony should have from 25 to 50 pounds of good honey or sugar syrup to winter on. A poor grade of honey in the combs had better be extracted, and the colony fed on a 2 to 1 sugar syrup (two pounds of granulated sugar mixed with one pound of water). The amount of protection for out-of-doors wintering depends on the severity of the winter. In the South no protection is needed. For our latitude hives should have double walls packed between with some dry material, planer shavings, leaves or chaff. If the hives are single-walled they should have an extra cover of either wood or several thicknesses of heavy paper. An absorbent cushion should be placed over the frames as a means of taking up the moisture coming from the bees. If colonies go into winter with plenty of young bees, plenty of stores, and are fairly protected, they are almost certain to come out strong and in good shape for a crop of surplus honey.

Recently there appears to be a tendency of changing from producing comb honey to that of extracted. The question of producing comb honey or extracted depends largely on locality and market. Comb honey brings better prices on the market than does extracted, but the latter is simpler in production. More extracted can be secured from a hive, since the bees are not required to build any comb as the same comb can be used successive times. Again, when there is only a light flow they are very slow to go into section supers than into full drawn frames. At present there is an exodus from comb honey to extracted, and those who produce quantities of the former and are successful may be wise by continuing, as the indications are that comb honey will command fancy prices in the near future. At this time there is practically no comb honey on the market.

The question of controlling swarming during a honey flow, has perhaps received more attention within late years than any other. Formerly, the criterion of success in bee-keeping was the number of swarms; but now it is recognized more as contrary to success. The ideal condition of a colony for producing honey, toward which all progressive bee-keepers aim, is to have the colony "full to overflowing" but not overflowing with bees. This condition is difficult to maintain. With the stimulation to brood-rearing in the spring, agitated by a flow of nectar, there is a tendency to swarm. Very few succeed in eliminating swarming entirely, but with proper methods and care it may largely be controlled. A system of hive manipulation has been brought out within the last year known as the Hand system which is supposed to do away with swarming entirely. It is a method of operating a hive or rather a double hive by which a colony can be made very strong, and by the turning of a switch at the entrance, the working force of bees can be turned into any part of the hive desired, and in this way there is no loss of energy or force in carrying surplus, and the causes which produce swarming are arrested. The practical utility of this method remains yet to be worked out fully, although those who have tried the system claim it to be a success.

The greatest progress that Apiculture has made in this State during the last year, and perhaps that has ever been made, is the passage of a Foul Brood law by the last session of the Legislature. The bill was drawn up by the State Bee-Keepers Association, endorsed by this body and the Horticultural Association before it was presented. Through the efforts of these various bodies and the earnest efforts of bee-keepers and their friends, the bill passed almost without any opposition, while similar bills in former sessions were ridiculed and hopelessly defeated. The bill provides for State Inspection of all apiaries in the State under the direction of the Secretary of Agriculture. Where the disease is found, directions are given for treatment of colonies infected. Where bees are kept in old-fashioned box-hives the owner may be required to transfer them into movable frame hives. It also provides for the destruction of hives and colonies where necessary and prohibits the sale of infected combs, bees or hive material. The unfortunate part of it all is, that the appropriation far carrying out its provisions was lopped off by the Legislature, thus preventing its being carried out effectively for the present.

During the year other states have been active in securing legislation. Similiar laws were passed in Kansas, New Jersey, Vermont, Tennessee, Minnesota and Illinois, and in British Columbia, for Canada, while progress has been made in other states that have not yet passed any laws of inspection. There are now 33 states that have laws in some form for the inspection of apiaries.

While argument is sometimes brought that the territory would be too large to be covered by inspectors and a law would be ineffective, the fact is true that in states where laws have been in operation for a number of years the disease has been practically brought under control. Pennsylvania bee-keepers, who have suffered so much from the disease, are so eager to make a fight against it that during the convention of the State Bee-Keepers' Association, held at Lancaster recently, a number of members qualified themselves by taking an examination, conducted by Dr. Surface the State Entomologist, and volunteered to inspect apiaries. As there are no provisions made for their payment of services, they expect to do it gratis.

The Bureau of Entomology of the Department of Agriculture at Washington is planning to do greater work for apicultural interests. Dr. Phillips and his corps of assistants are doing splendid work in combating diseases. A number of bulletins on bees have been published for distribution and may be had by writing for them to the Department of Agriculture. One of these is Bulletin No. 397, "Bees," an instructive work on keeping bees; another is Bulletin No. 442, "The Treatment of Bee Diseases." This should be in the hands of every bee-keeper. It describes the indications and symptoms of the various diseases, how they are spread and how to treat them. The treatise is by Dr. Phillips and is the most up-to-date and reliable of any thing that was ever published.

As a further means of distributing information, Secretary Wilson, after a consultation with a committee of bee-keepers, has consented to authorize the publication of several additional bulletins: one on the relation of bees to horticulture and another on the value of honey as food, besides ordering the preparation of press notices to every paper in the United States.

A number of years ago Pennsylvania was not known among the fruit states, and only within recent years was it discovered that choice fruit, equal to that of any progressive district of the United States, can be produced here. We have only recently awakened to the possibilities of our State. When we consider that only a few colonies of bees covering in flight a radius of a few miles can store a ton of honey, and when we see acres upon acres of land not winged by bees, we realize that there must be millions of nectar-secreting flowers that remain unvisited by them, and there must be tons of honey wasted upon the desert air.

If the soil is uncultivated, there still remains in it a latent power that some wanderer may find centuries later; if the mineral in the earth remains unearthed, it loses none of its virtue or value. But here is a product, formed daily, that may satisfy the desire of a peasant or grace the menu of a king, that "if the harvest is ready and the laborers are few" or none, it is lost forever.

On motion, properly seconded and duly carried in the regular way, this report was received, and ordered to be filed in the regular way.

The CHAIRMAN: The next number on the program is the Report of the Meteorologist, by Mr. E. R. Demain.

The Secretary: Mr. Demain is not here, but his paper, if it is sent in, will appear in its proper place in the proceedings.

The CHAIRMAN: Next in order is the Report of the Mineralogist, by Mr. Baird Halberstadt, of Pottsville.

MR. HUTCHISON: Mr. Halberstadt is in the city; but is not in the room at present. His report can be taken up later.

The CHAIRMAN: We will then take up the report of the Agricultural Geologist, who is here this afternoon and prepared to address us.

COL. WOODWARD: I would like to get the Resolutions Committee together. We will go up to the Secretary's office and go over the two or three resolution we have on hand.

The SECRETARY: Mr. Chairman, there is a gentleman here who has a resolution all written out which he would like to read.

The CHAIRMAN: Mr. Naginey will please read his resolution.

Mr. Naginey read the following resolution:

WHEREAS, A destructive fungous disease known as the "chestnut tree blight" has appeared in many counties of Pennsylvania, causing a serious loss to timber owners and taxpayers; and

WHEREAS, The blight threatens the entire destruction of this valuable native species of tree in Pennsylvania and adjoining states, if not checked and eradicated.

Therefore, be it resolved, That the Pennsylvania State Board of Agriculture hereby pledges its earnest and active co-operation with the Pennsylvania Chestnut Tree Blight Commission in the efforts of that Commission to control and eradicate this new enemy of our forests, recommending that each member of this Board assist so far as practicable in promoting public interest in the subject, that the work of the Commission may be advanced as rapidly as possible throughout the affected areas of the Commonwealth.

Be it further resolved, That the bill introduced into Congress, appropriating $80,000 for the use of the U. S. Department of Agriculture in similar work in the various states where the chestnut tree bark disease has appeared, is recognized as a worthy and deserving measure, and the Pennsylvania delegation in Congress is respectfully urged to give it their united support.

The CHAIRMAN: This resolution will be referred to the Committee on Resolutions.

MR. SHOENER: Before this Committee retires, has there been a resolution offered in reference to the Gunner's License Law? If not, I would move that a suitable resolution of this kind be prepared by the Committee.

MR. FENSTERMAKER: I have one that may not entirely cover the ground, but it can be revised and amended by the Committee if they see fit. It is as follows:

"RESOLVED, That we are opposed to any system of Gun License Law which would require the taking out of a State License by the owner of any real estate to hunt on his own premises."

MR. SHOENER: Mr. Chairman, that would not cover it; my notion was that a suitable resolution be drawn up by the Committee.

The SECRETARY: I second it.

Being properly moved and seconded, this motion was carried in the regular way.

The CHAIRMAN: Now the point that you wish to make is, that this resolution be amended by the Committee.

The SECRETARY: I think the mover's idea was that the Committee on Resolutions should prepare a resolution to take the plan of the one just offered.

MR. JOEL A. HERR: The Memorial Committee is ready to report.

MR. GEARHART: The Legislative Committee is ready to report, and a number of us would like to make the 2.50 train.

The CHAIRMAN: We will then take up the report of this Committee at this time.

Mr. Gearhart then read the report of the Legislative Committee, which is as follows:

REPORT OF THE COMMITTEE ON LEGISLATION

The Committee on Legislation beg leave to make the following Report:

This being a year when the Legislature is not in session, the Committee on Legislation have somewhat abbreviated their Report, reviewing the demands for the past rather than claiming new laws to be passed, from any new claims made by the present State Board of Agriculture.

The farmers of Pennsylvania have long been united in sentiment, however, short in action upon the proposition, that the roads to which the State owes its greatest obligation are those thousands of miles of township roads which the farmer must traverse in carrying his crops to market. We look upon this proposition as important, economically, to the city man as well as the farmer. We, therefore, review our stand for a law which will pay to townships, by the State, fifty per centum of all road taxes collected in said townships not, however, to exceed $20 a mile. Such a law has twice passed our Legislature only to be made inoperative by executive disapproval. We regret that our last Legislature failed to appropriate sufficient money to meet the obligation assumed by the State, when it passed the Jones' Road Bill in 1909. We urge all farmers to insist that they use their votes and influence with the view of securing sufficient appropriations by our next Legislature to meet the deficiencies created in every township in Pennsylvania.

We approve the plan of the State to build 8,000 miles of intercounty highways, as provided for, by what is known as the Sproul Road Bill passed by the last Legislature. This work will not only provide good roads, but will tend to reduce local taxation, as these roads will be maintained solely by the State. Bonding the State, however, for fifty million, we are not so free to say is good business management.

CHESTNUT TREE BLIGHT

We favor all active efforts towards the suppression of what is known as "The Chestnut Tree Blight," which is attacking the chestnut timber in various parts of the State.

We endorse and hope for the passage of the Bill now before Congress appropriating $80,000 for the aid of this very important work.

EQUALIZATION OF TAXATION

We most strongly assert that the taxes as levied and collected in Pennsylvania place an unequal and unjust burden upon the farmers and home-owners, inasmuch as corporate and personal property pays but 3 mills on the dollar while real estate pays 16 to 18 mills. As a means for equalizing taxation we urge increased appropriations for roads and schools, both of which are State, and not local matters of interest and import. We have outlined above our position upon road appropriations. As to schools, we reiterate our demand that the State pay to school districts a sum equal to the minimum salary of all teachers employed in each district for the minimum school term. As a means for increased revenue, we suggest that a tax of 1 mill might be placed upon oil and coal and such revenue go towards the construction of good roads.

OLEOMARGARINE

One of the items of great importance to the farmers, is legislation affecting our great dairy interests; and there is *no greater* menace to this interest than the colored product known as oleomargarine used as an imitation for butter. We have an excellent law in Pennsylvania upon this subject, which only awaits vigorous and conscientious enforcement to make it a sure and safe protector for the farmer. Efforts were made by the oleomargarine people before the last Legislature to hobble this law, but were blocked by the intelligent presentation of the facts by the organized farmers, led activity by the State Grange. It is our duty to be ever alert upon this subject. At the present time a strong effort is being made, on the part of the packing interests who control the market in oleomargarine, which is largely made-up of by-products from the slaughter houses, to secure Federal legislation which will place oleomargarine on a level with good butter. The danger to the farmer is apparent, and the damage to be done by such legislation *cannot be estimated.* We should see that our Congressmen and United States Senators are informed, in no uncertain terms, that the farmers of Pennsylvania are opposed to legislation which will permit the placing of this substitute upon a *level with the real dairy product.* The fraud in oleomargarine is in the *coloring* of it, and this is the *one great point* at issue, and the *only one* the packing trust cares to carry. We strongly insist that it be so dealt with so as to prevent its being colored. Yellow is the *natural* color of butter. The natural color of oleomargarine is *white.*

POPULAR GOVERNMENT

We believe that the government of this—and every other state—should be brought more closely to the people. (Government has been taken from the people by years of tolerance until there is a condition when a few political manipulators have the power, through patronage and the control of the public funds, to make and unmake laws to suit themselves). We believe the people should be trusted with absolute sovereignty, and therefore reiterate our demand for these great principles of real democracy. We urge the submission to the people by our Legislature, to pass a constitutional amendment which will unite these proposition into the fundamental laws of our State.

As a part of this same item, we further urge the direct election of our United States Senators.

PARCELS POST

The farmers of America have for years demanded of Congress the enactment of a law which will entrust the government with the carrying of parcels as is done by all other governments in the civilized world. However, we stand by the expression made by an honored member of this Board that we should have *"a real parcels post;* no fake substitute." The Express Companies are parasites upon the legitimate functions of the postoffice department. We see no reason why the farmers should not have the same collect and delivery privileges, enjoyed by the town and city dwellers, nor do we see why anyone should pay the outrageous tribute imposed by the Express Companies, when we have our most efficient and trustworthy mail department of government ready at anytime to assume all of this carrying, from the most thickly-settled urban section to the most remote rural section, and vice versa. We favor the passage of the bill now before Congress, known as the Lewis Bill.

PROTECTING AGRICULTURE

We earnestly commend the work of our Department of Agriculture in safeguarding the farmer's welfare throughout Pennsylvania. We regret that the bills asked for by the Department for the rigid inspection of Paris green and linseed oil and for the proper labeling of field seeds, were not passed by the last Legislature. We believe a pure seed law should provide for a penalty for those who sell seeds containing noxious weeds, or being less than 99 per cent. pure. We regret that the Agricultural Extension Bill, providing for an appropriation of $60,000, failed to become a law; passed the House but failed in the Senate. We urge increased appropriations for Farmers' Institute work, recognizing the great good thus done by the Division of Farmers' Institutes under the supervision of Hon. A. L. Martin.

In conclusion, we again urge our farmers to look upon these matters in a practical, rather than a sentimental, manner. We get nothing by adopting resolutions. We must join words with works and see to it, through our efforts as citizens, that our demands are enacted into law.

STATE COLLEGE

We demand increased appropriations for our Pennsylvania State College, of which institution and its magnificent work and excellent management we are justly proud.

FRUIT INTERESTS

We recognize that the fruit interests of our State is becoming a great factor, and that Pennsylvania is being noted as a leading State among other states of the Union for its production of delicious fruit. The good work accomplished by the Division of Zoology is apparent to us all.

Your Committee on Legislation reiterates the position long held by this body, that one of the important duties of the farmer is to be alert at all times and in all seasons as regards the laws under which we must carry on our work. We believe in the improvement of farm methods, the advance of agricultural science and education. But we *recognize* the fact, that the farmer must also safeguard his interests through legislation if he would occupy the position in our political life to which his economic importance entitles hm.

To ths end, we reaffirm our conviction that there are too few farmers in our legislative halls. We most heartily commend the work of the farmers who have been members of our law-making bodies in the past, and insist that more farmers should be elected to represent the people. We, therefore, urge that all members of this Board and all farmers throw aside partisan and selfish considerations, and determine, by their votes, that we shall have more actual, bona-fide husbandmen in our legislative halls.

Respectfully submitted,
PETER GEARHART,
S. S. BLYHOLDER.
H. G. McGOWAN.
H. C. SNAVELY.
MATTHEW RODGERS.

The CHAIRMAN: What is the pleasure of the Board?

MR. HUTCHISON: I move that the report of this Committee be received and published with the proceedings.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: We are now ready for Prof. Surface—the Report of the Ornithologist.

Professor Surface made the following report:

REPORT OF THE ORNITHOLOGIST

By PROF. H. A. SURFACE

(This address was illustrated with lantern slides).

As no very remarkable events have occurred in the ornithological field during the past pear, the Ornithologist of the State Board of Agriculture, in giving his Annual Report, thinks it best to base his remarks upon our present State law in regard to birds, and to show illustrations of the birds that are unprotected by law, with emphasis that all other kinds of birds than those here specifically mentioned are definitely protected by law in this State at all times, unless they are definitely named as game birds, when they have stated open and closed seasons. Those that are upon the "black list" are as follows:

(1). Blue Jay.
(2). English Sparrow.
(3). European Starling.
(4). Kingfisher.
(5). Shrike.

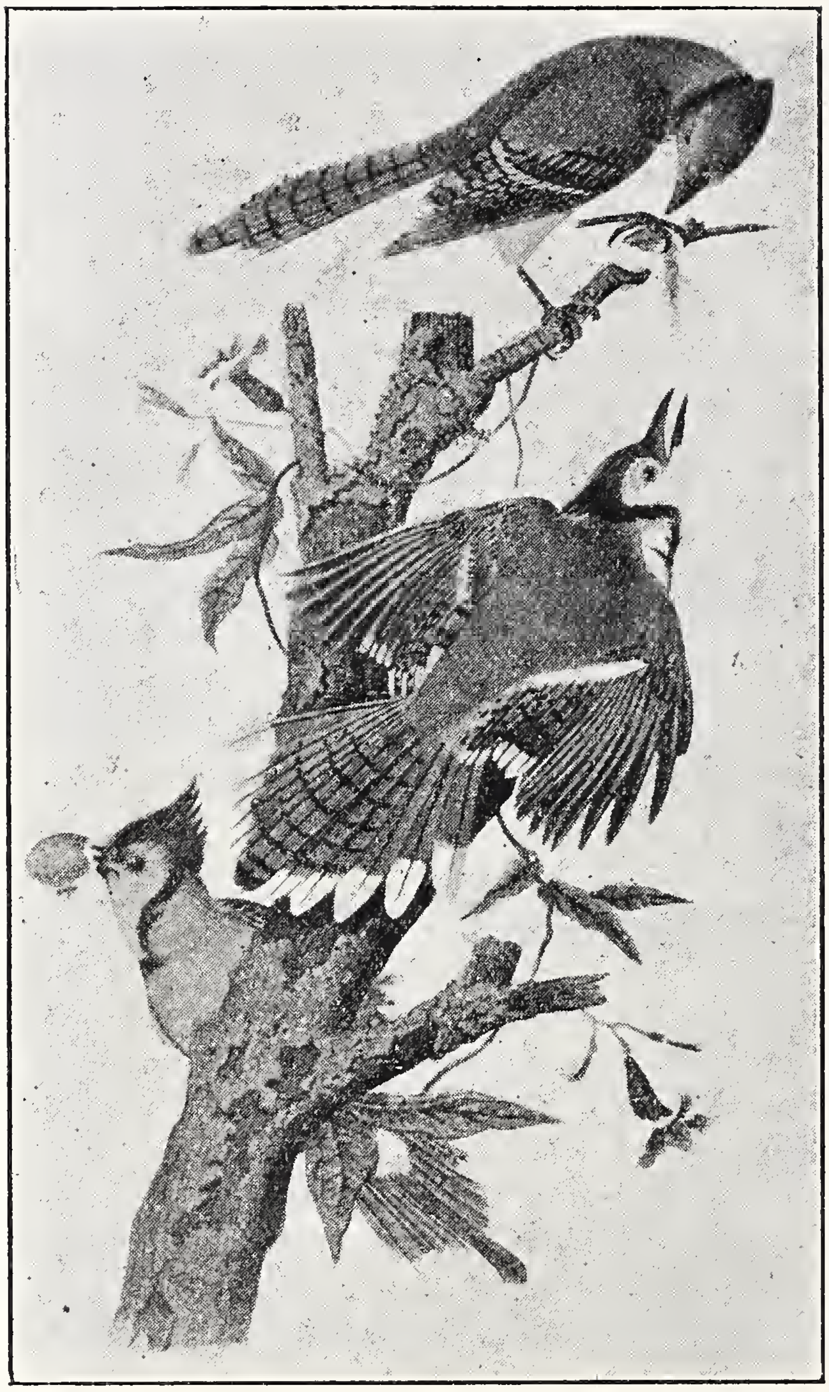

Fig. 1. Blue-Jay.
1. Male. 2. Female.

(6). Eagle.
(7). Buzzard.
(8). Osprey.
(9). Sharp-shinned Hawk.
(10). Cooper's Hawk.
(11). Goshawk.
(12). Duckhawk.
(13). Pigeon Hawk.
(14). Great-horned Owl.
(15). Barred Owl.
(16). Crane.
(17). Heron.
(18). Bittern.
(19). Crow.
(20). Raven.

Let us discuss each in turn.

BLUE JAY

The Blue Jay (see Fig. 1) has a bad reputation for its supposed destruction of the eggs and young of other birds. It is very doubtful if this be true, but it is quite a destroyer of insects, and certainly is not nearly so bad in regard to egg destruction as the English Sparrow, which we so wrongly tolerate. The Jay lives mostly in more or less wooded districts, or in orchards, where it can find concealment during certain parts of the day. It is with us the year round, and is often conspicuous by its noisy calls, and brightly colored blue, white and black plumage. In condemning it for its habits of feeding on the eggs of other birds, we must not forget that it feeds also upon insects of several kinds, while the bulk of its food consists of wild berries, seeds and acorns. We know that where the Blue Jay is abundant, there we also find other birds, and therefore the Jay is not so seriously destructive in character. We do not wish to think of the day when the Blue Jays are exterminated, and we, therefore, regret that it is upon the unprotected list.

In writing on "The Blue Jay and its Food," Doctor Beals, who carefully examined the contents of stomachs of about three hundred Jays, published in his official report in the year book of the Department of Agriculture for the year 1896, the following:

"The most striking point in the study of the food of the Blue Jay is the discrepancy between the testimony of field observers concerning the bird's nest-robbing proclivities and the results of stomach examinations. The accusations of eating eggs and young birds are certainly not sustained, and it is futile to attempt to reconcile the conflicting statements on this point, which must be left until more accurate observation have been made. In destroying insects the Jay undoubtedly does much good. Most of the predaceous beetles which it eats do not feed on other insects to any great extent. On the other hand, it destroys some grasshoppers and caterpillars and many noxious beetles, such as Scarabaeids, click beetles (Elaterids), weevils (Curculionids), Buprestids, Chrysomelids, and Tenebrionids. The Blue Jay gathers its fruit from nature's orchard and vineyard, not from man's; corn is the only vegetable food for which the farmer suffers any loss, and here the damage is small. In fact, the examinations of nearly three hundred stomachs shows that the Blue Jay certainly does far more good than harm."

In view of the above authoritative statements expressing views which are emphatically endorsed by the writer of this report, is it now time that the intelligent citizens and law-makers of Pennsylvania get busy to bring about legislation to protect instead of destroy the bird, which is at once so useful and so beauiful.

ENGLISH SPARROW

The English Sparrow (see Fig. 2) is multiplying with remarkable rapidity, due chiefly to the indifference of mankind. On almost every point, it has proven itself a veritable nuisance. Not only does it feed upon grains of field crops, and upon garden plants of many kinds, but it is objectionable because of its filthy effects in soiling property that might otherwise be clean or presentable. Also, it is certainly the chief aid in carrying the San Jose scale from place to place, and in the poultry yard its presence results in considerable loss through devouring the food intended for poultry.

We believe that the English Sparrow nuisance would be greatly reduced if it were made illegal to let this bird nest upon the premises. It is not difficult to modify its nesting site, so that it will be unable to find a footing upon the cornices of buildings and in other places where its litter is heaped into an uncouth mass and used as a nest. Where it starts to build a nest in an accessible place, it is well to permit it to do so, and wait until after the nest is finished and the eggs are laid and hatched before destroying it. In fact, if the young birds be left in the nest until they are almost ready to leave it naturally, this will lengthen the period until the production of the next brood and result in fewer birds per year than though this nest were destroyed as soon as discovered, or by the time its eggs were laid. To do this, some persons are now placing for the sparrows nesting boxes provided with lids which permit the removal of the young or eggs. In removing nesting material it should be burned rather than merely thrown upon the ground and left for Sparrows to carry away in the formation of new nests.

EUROPEAN STARLING

The European Starling (see Fig. 3) is a comparatively newly introduced bird in America, which multiplies rapidly, and to which your Ornithologist has called attention in previous reports. In appearance it is very much like the Blackbird, or female Cowbird, and in habits may be said to be intermediate between our ordinary Blackbird and the English Sparrow. During the recent cold weather the Starling was seen in large flocks in the eastern part of the State. It is supposed that they came from the region between New York City and Philadelphia, where they have recently been multiplying. It is our opinion that the Starling is a good-seed-eater, which will prove to be as objectionable as the English Sparrow, and it should, therefore, be known and destroyed. It lives and feeds mostly in open fields, and can be recognized by its single short whistle or note.

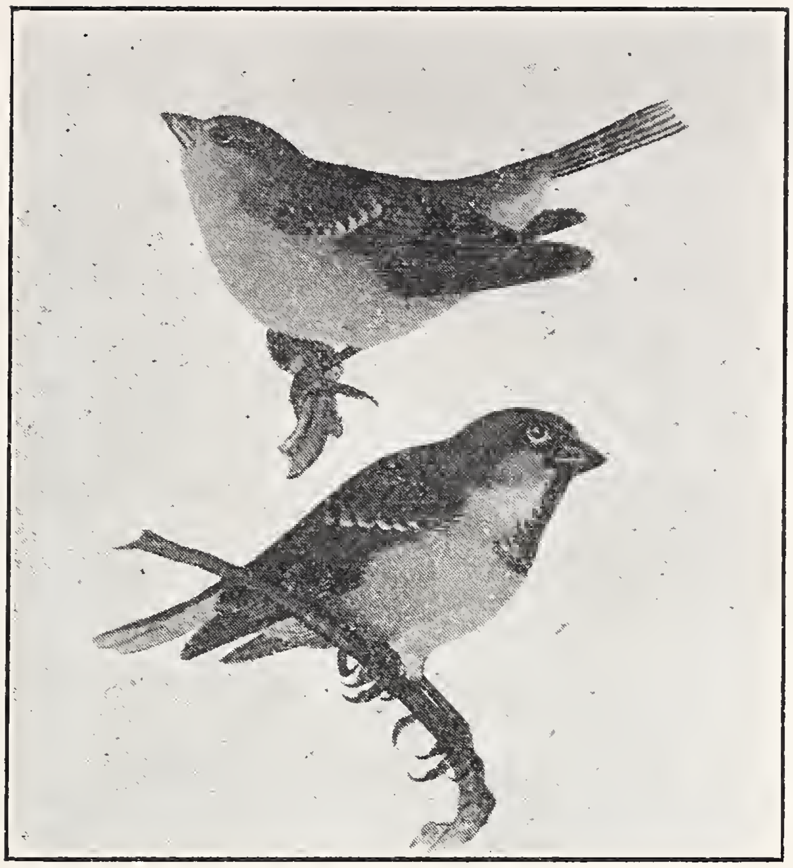

Fig. 2. English Sparrow.
1. Male. 2. Female.

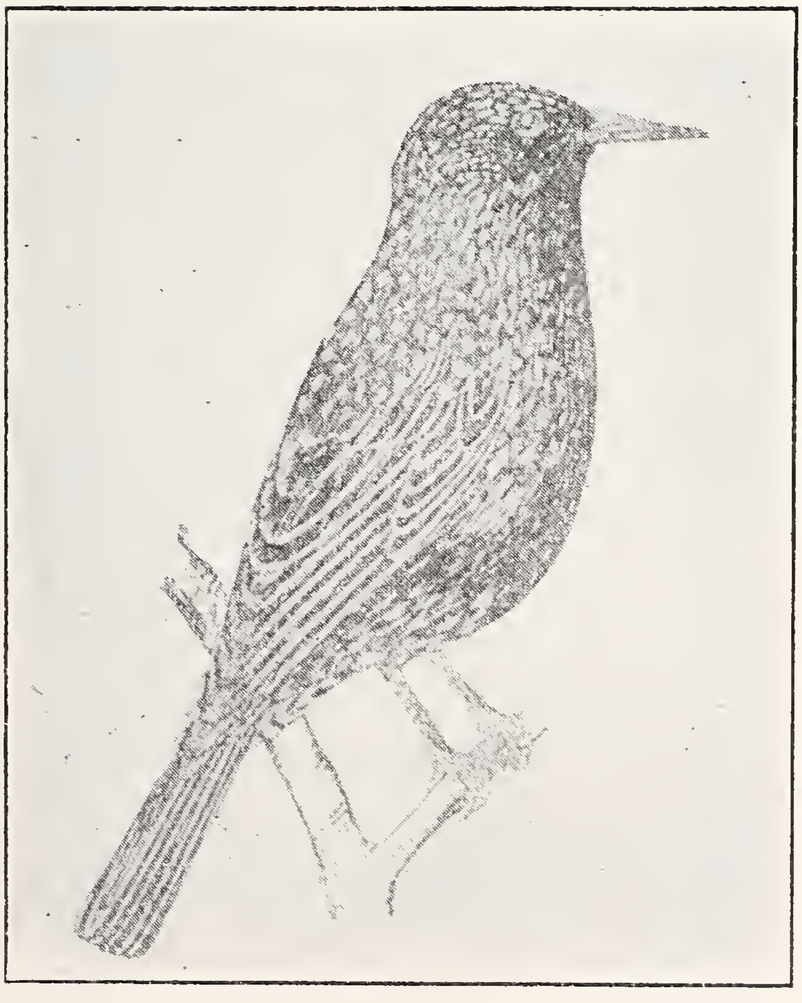

Fig. 3. Starling.

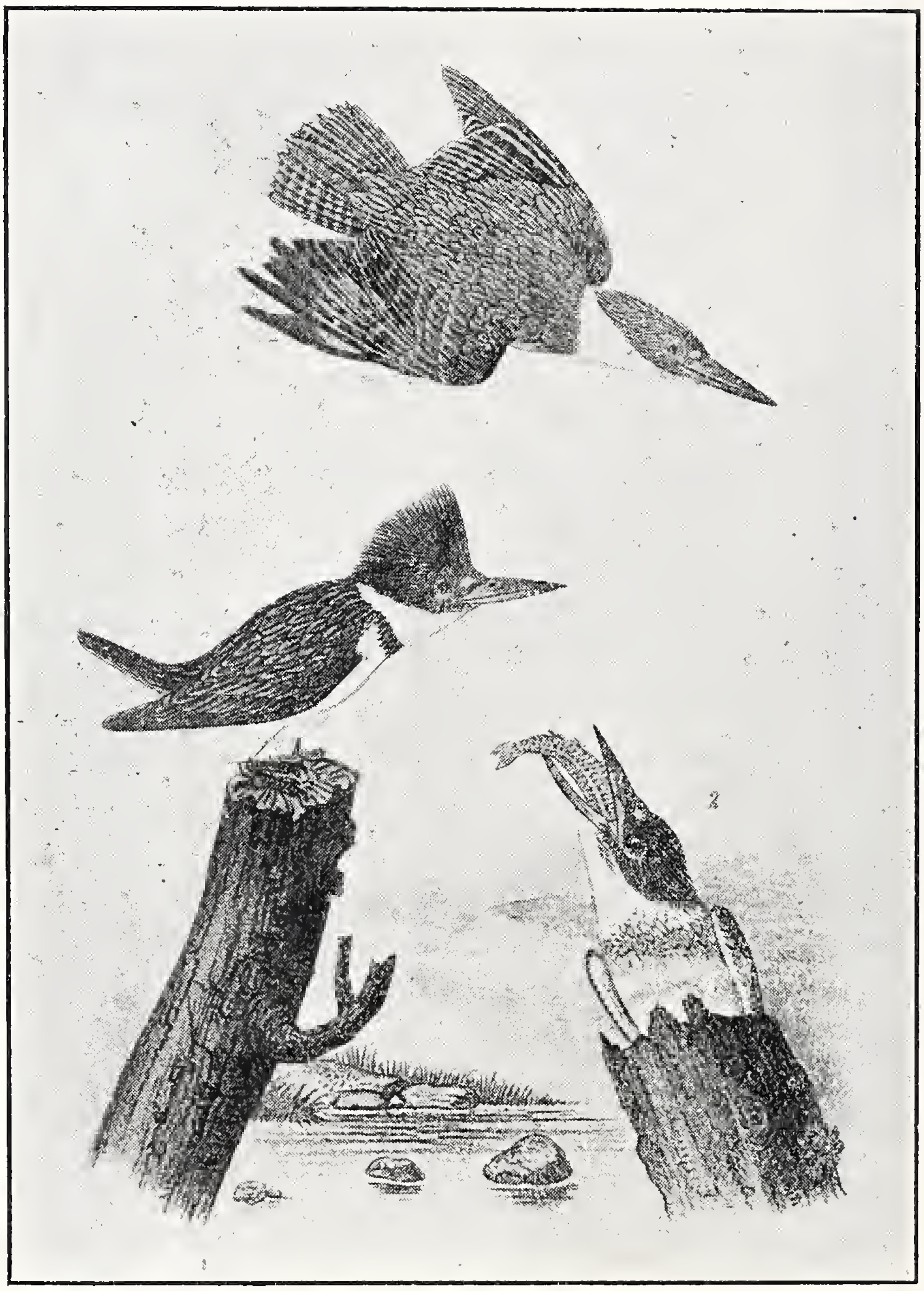

Fig. 4. Belted Kingfisher.

1. Male. 2. Female.

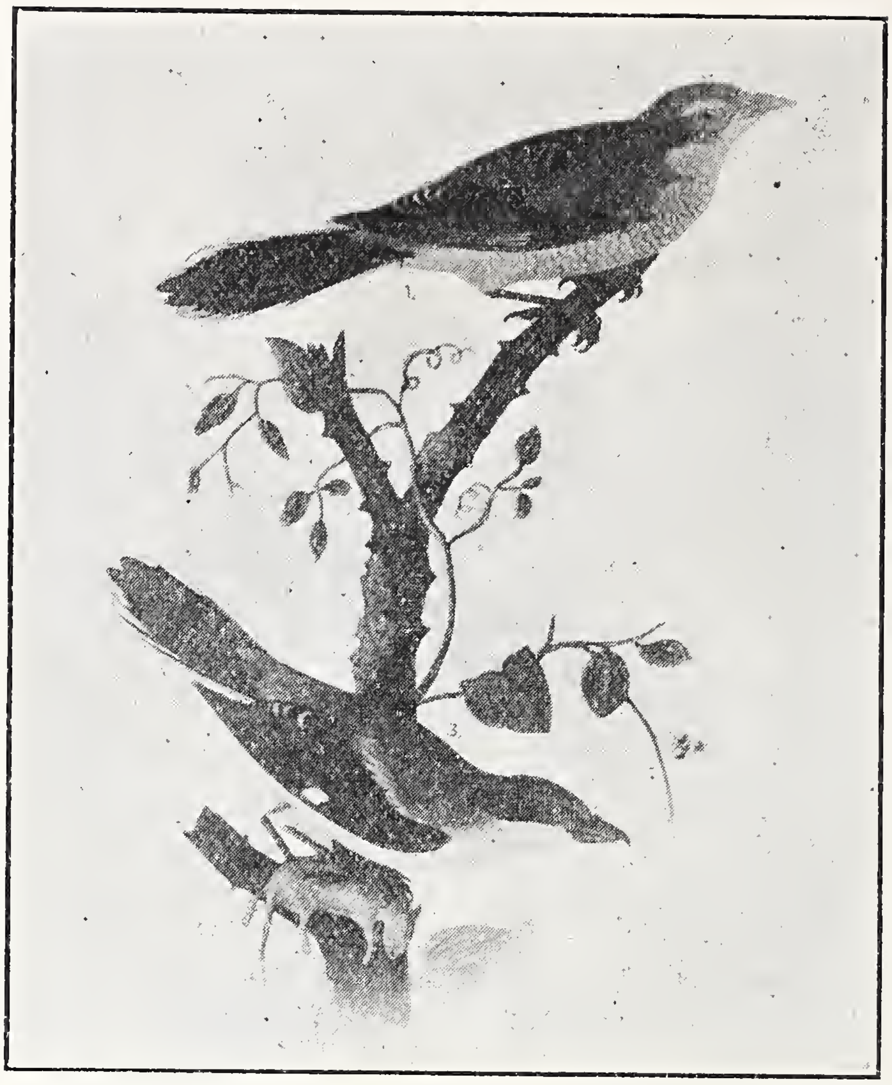

Fig. 5. Logger-headed Shrike.
I. Young. 3. 4. Adult.

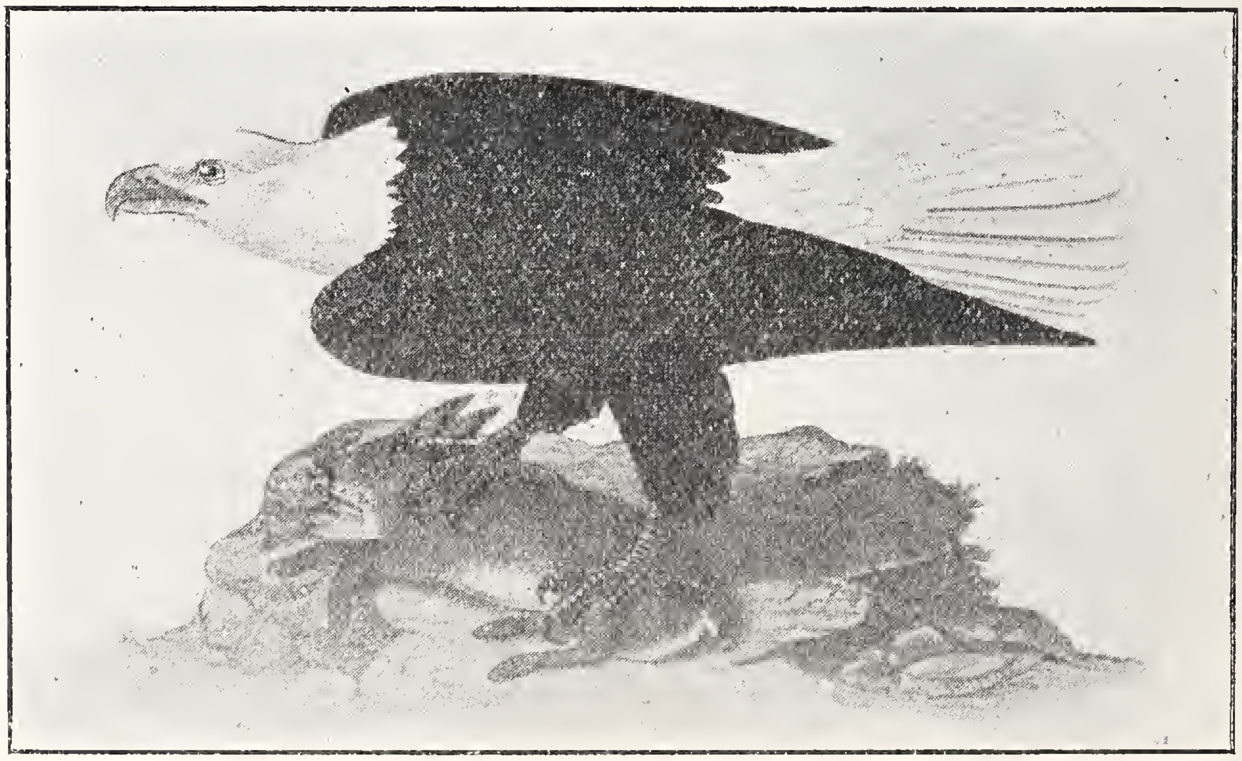

Fig. 6. Bald Eagle.
Adult.

KINGFISHER

The Kingfisher (see Fig. 4) is doubtless on the black list because it destroys fishes; but as all "suckers" are not alike, so all fishes are not the same kind. A careful study of its habits shows that it feeds mostly upon minnows, suckers and other soft-rayed or slow fishes, which are in turn the enemies of the eggs of the higher or spiny-rayed fishes, such as the perch, bass and pickerel, which are really the fine game fishes. The trout is too wary to be caught by Kingfishers, except where they are kept in artificial conditions, as in ponds, where they do not have opportunity for natural concealment. This bird is one of the most beautiful and interesting in the natural elements in landscape scenery, and from a scientific, as well as an esthetic standpoint, is worthy of preservation.

THE SHRIKE

As a matter of fact, there are two species of Shrikes liable to occur in Pennsylvania. One is the Great Northern Shrike or the Butcher Bird; the other is the Southern Shrike, and is also called the "Loggerhead." (See Fig. 5). These are Passerine or Perching Birds, which have acquired the raptorial habit. They live like small hawks. They are peculiar in the fact that they will kill insects, frogs, mice, small birds, etc., and hang them in bushes or impale them on thorns near their nests or in other favorable storage places. They appear to do this in times of plenty, in order to establish larders upon which they can draw in periods of scarcity.

During the winter we have not infrequently found large grasshoppers impaled upon thorns where the Shrikes had evidently placed them during the previous summer. While it is possible that they may feed upon a few small birds, like our native sparrows, and thus may be objectionable, we do know that they are among the great enemies of mice, the large insects of many kinds, and the English Sparrow. We have seen them pursue the latter with the tenacity of the hound following its prey, until the Sparrow became so fatigued that it would attempt to seek protection in a bush, there only to be sought out and killed by the Shrike.

This bird generally breaks away the skull of its victim, eats its brain, and hangs its remains upon a spine, or in the small fork of a bush. Because of its value in destroying mice, insects, and the English Sparrow, we regard it as more beneficial than obnoxious, and regret that the laws of man have seen fit to place this bird upon the black list.

THE EAGLE

The law does not state which of the different species of Eagles are to be unprotected in this State. The two most commonly found, though rare, are the Golden Eagle and the Bald Eagle. (See Fig. 6).

The stories of the Eagle carrying away children are, so far as we can learn, almost always unfounded. These birds live mostly along the seashore, where fish can be obtained, or scattered in the mountainous districts. As long as the Bald Eagle is the "Emblem of our Country," it is entitled to our respect and efforts at protection.

THE BUZZARD

By a remarkable turn of events, the Turkey Vulture or "Turkey Buzzard" (see Fig. 7) which was once among the most carefully protected of birds, has now become an outcast, seeking a friend. This is because science has revealed the fact that this bird, which feeds solely upon dead animal material, may carry the germs which cause death, and spread them to other parts of the country, thus facilitating the spread of disease. In the streets of some of the Southern cities, such as Charlestown, S. C., the Turkey Buzzard can be seen as much at home as "chickens in our gardens." They are there protected because of their value as scavengers, and in the economy of Nature we certainly believe them to be properly recommended. If they are so serious in effects as to justify extermination, this should be the sentence; but we believe it far better for our State to pass a law providing for the proper and immediate disposal of the bodies of all domesticated animals that die from contagious or infectious diseases, rather than for the destruction of the Turkey Buzzard, because he may, perchance, in rare instances, spread such disease when performing his natural duties as scavenger and thus filling its place in an infinite plan. Especially is this true when we remember that germs of such diseases are liable to spread by several other means, such as contaminated water, crows, dogs, winds, etc. As the term "Buzzard" is accurately applied to the Hawks of the genus, Buteo, are wondering why our State does not change the name to "The Turkey Buzzard," which belongs to the family of Vultures, if this is the bird that it was intended to legislate against?

THE OSPREY

The Osprey or Fish Hawk is rare in this State, but rather common along the Atlantic Coast. (See Fig. 8). We wonder how many farmers in Pennsylvania ever saw a live Osprey? Certainly but few. We are also wondering how many Pennsylvania fishes were destroyed during the past year by the Osprey. Certainly far fewer than were kept from coming up-stream by means of the McCall's Ferry Dam, with its geometrical puzzle called a "fishway." We are wondering if it is advisable to legislate against a bird so interesting, and also so rare, and so absolutely innocuous to the farmer as the Osprey or Fish Hawk!

SHARP SHINNED HAWK

Among the hawks on the black list are the Sharp-shinned (see Fig. 9) which is sometimes wrongly called the "Pigeon Hawk;" the "Cooper's Hawk;" sometimes called the "Chicken Hawk;" the Goshawk, which is sometimes called the "Blue Hen Hawk;" the Duck Hawk, and the Pigeon Hawk. Among the hawks protected by law are the Sparrow Hawk, Kites, Marsh Harrier, Red-tailed Hawk, commonly called the "Hen Hawk," Red-shouldered Hawk or Buzzard, Swainson Hawk, the Broad-winged Hawk, and the Rough-legged Hawk. Among these are the most common of the larger hawks in Pennsylvania.

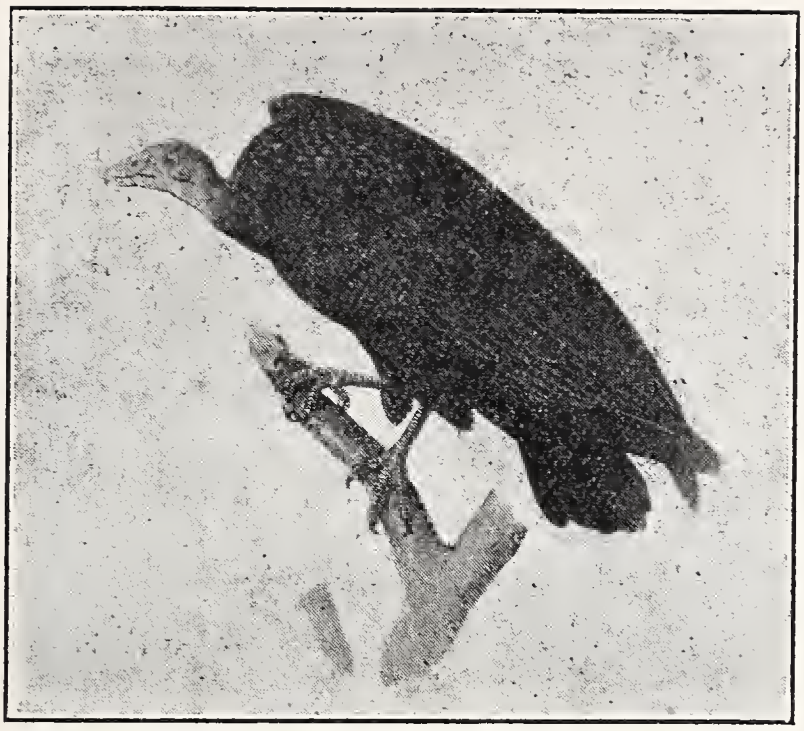

Fig. 7. Turkey Buzzard or Vulture.

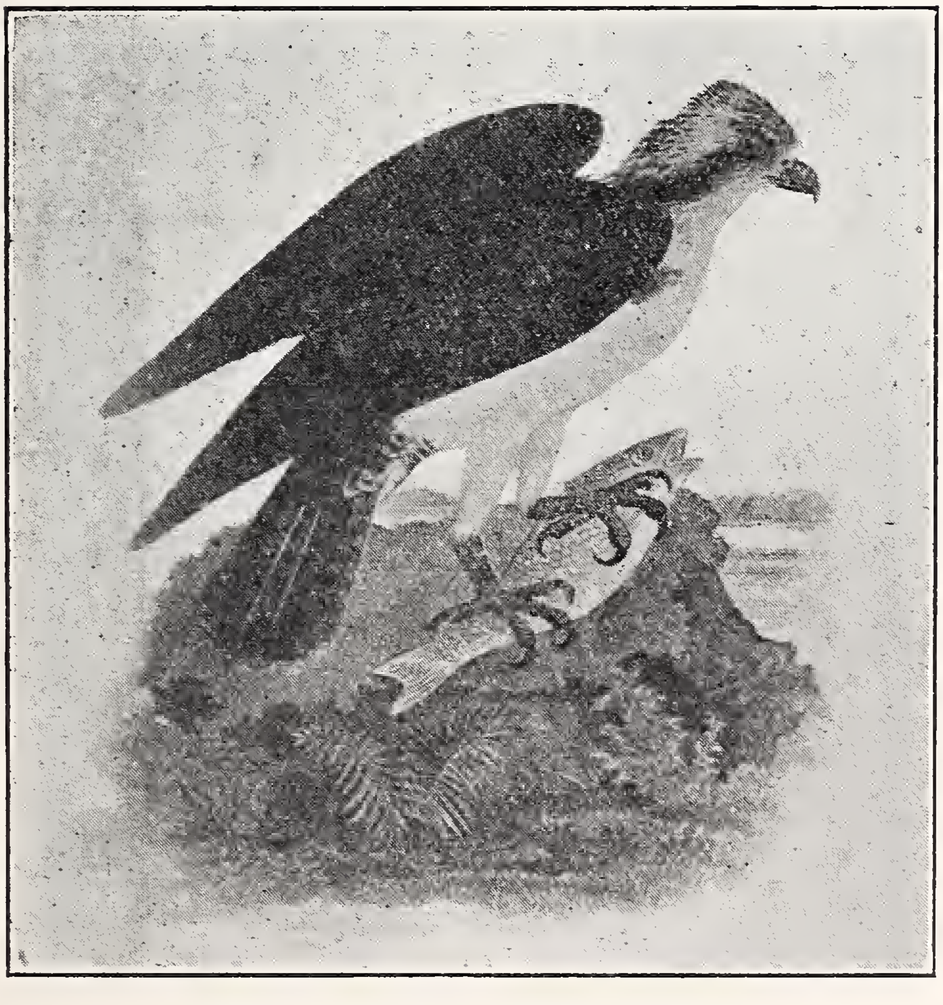

Fig. 8. Osprey or Fish Hawk.

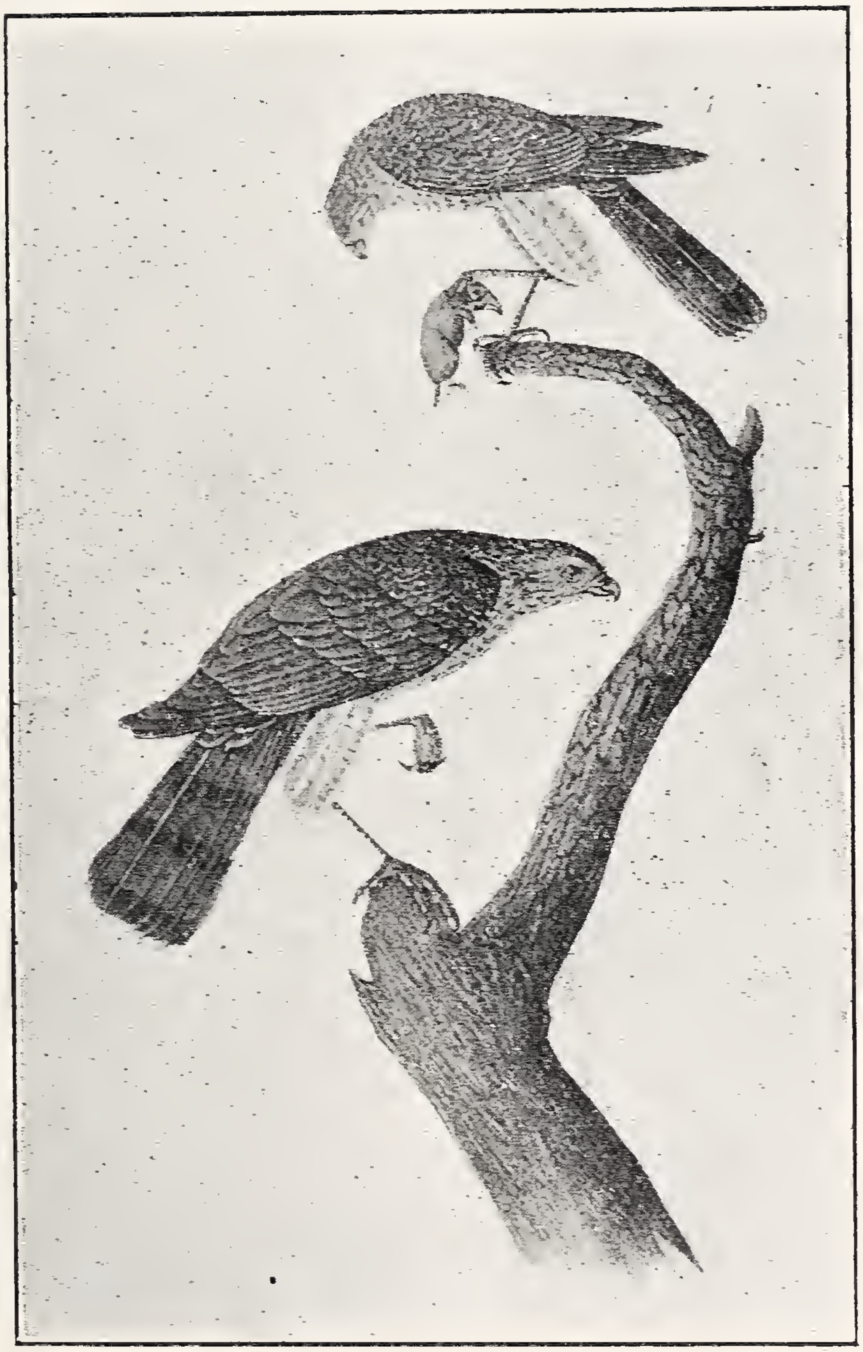

Fig. 9. Sharp-shinned Hawk.

1. Male. 2. Female.

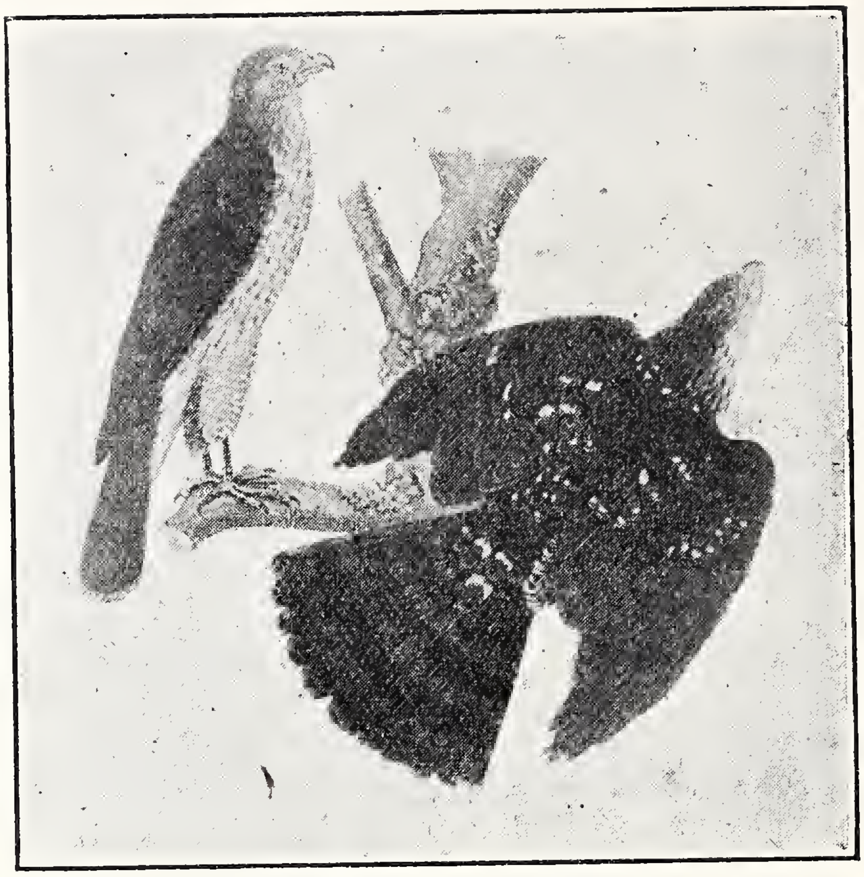

Fig. 10. Cooper's Hawk.

2. Male. 3. Female.

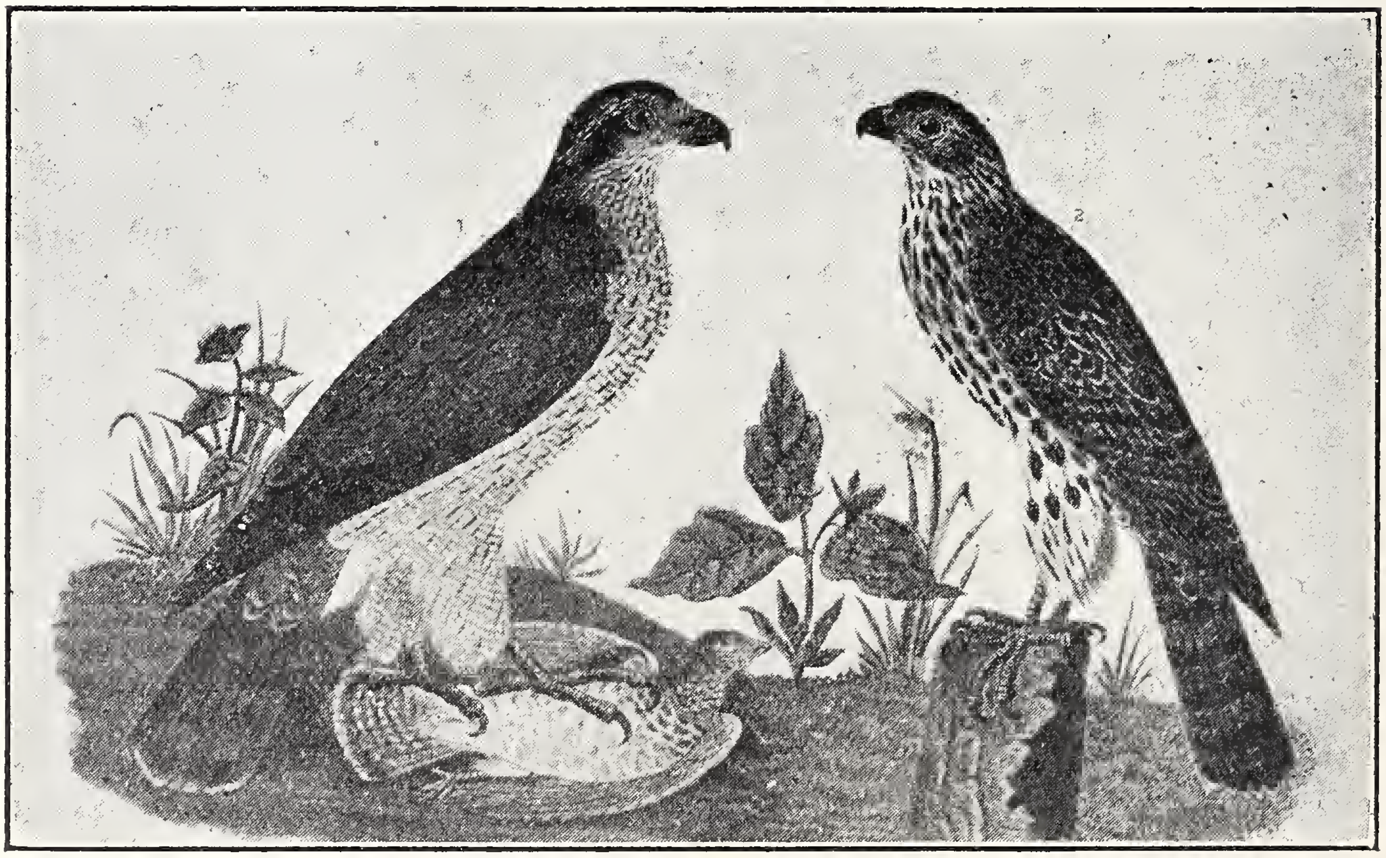

Fig. 11. American Goshawk.

I. Young. 3. 4. Adult.

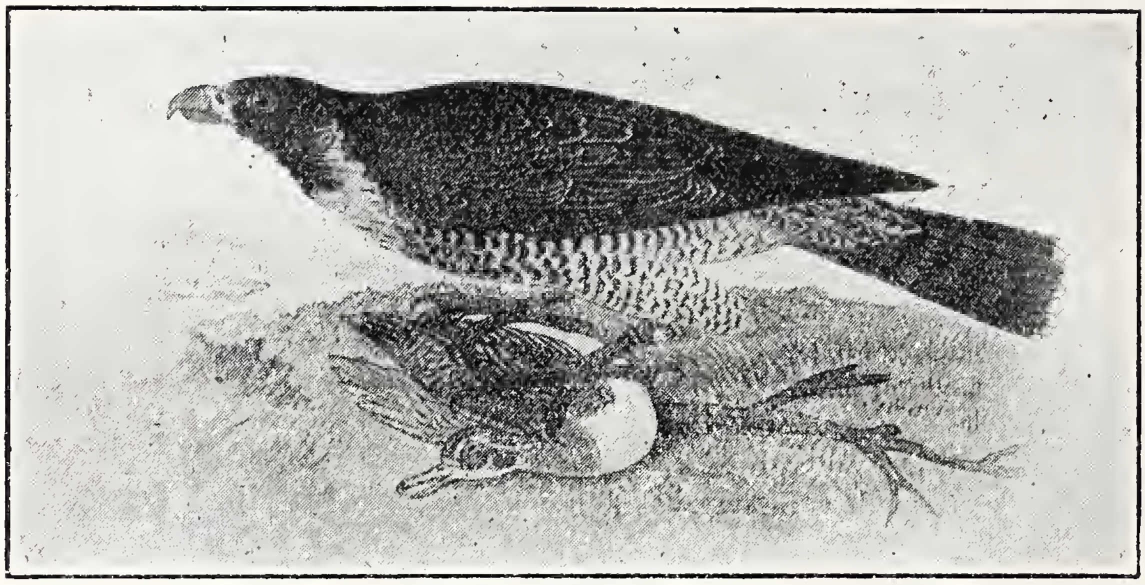

Fig. 12. Duck Hawk.

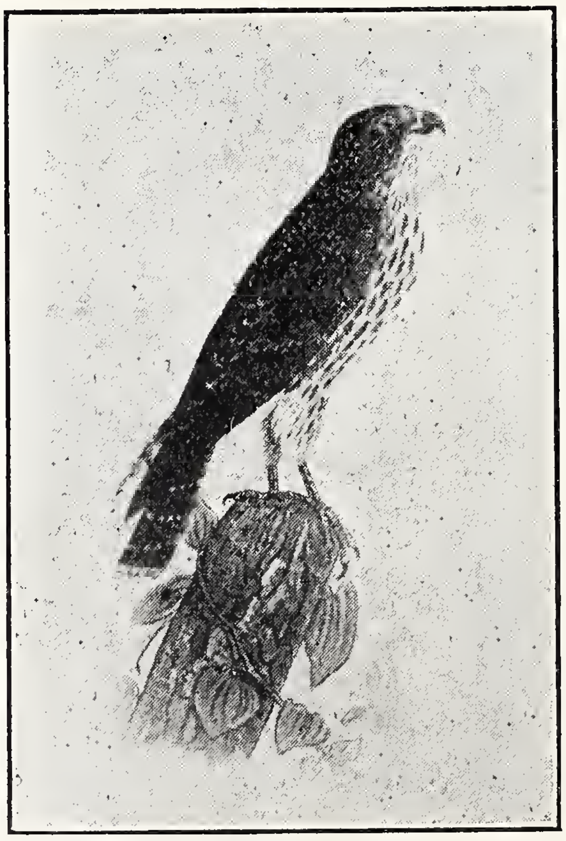

Fig. 13. Pigeon Hawk.

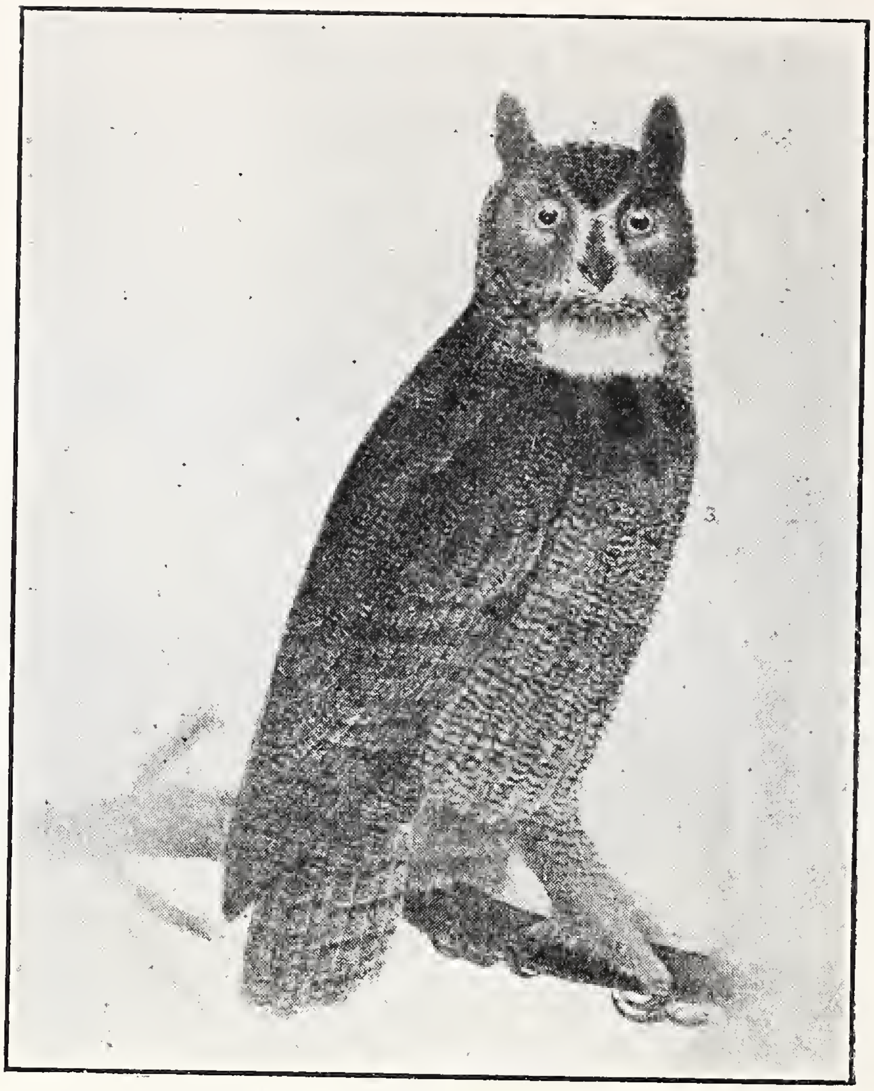

Fig. 14. Great Horned Owl.

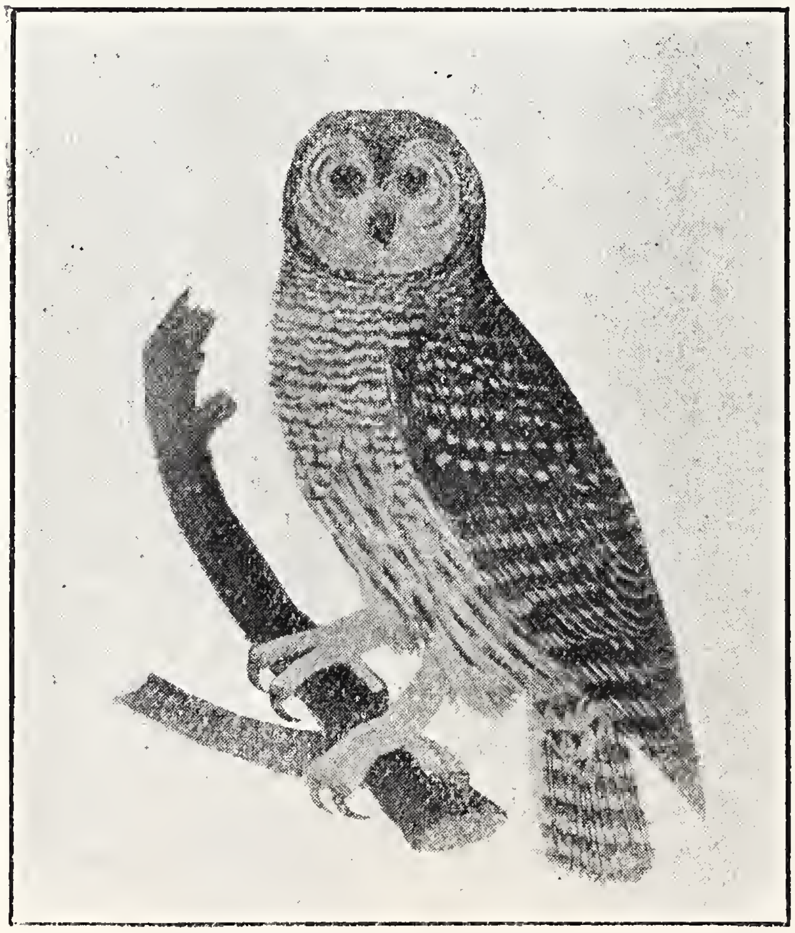

Fig. 15. Barred Owl.

COOPER'S HAWK

It is evident that the reason for placing the Sharp-shinned Hawk and Cooper's Hawk (see Fig. 10) on the black list is that these birds sometimes destroy poultry or smaller birds, but, in truth, they are among the most effective enemies of the mice and English Sparrow, and are not always enemies of poultry. Their economic results would probably justify their extermination.

THE GOSHAWK

The Goshawk (see Fig. 11) is with us in the winter only, and feeds chiefly upon rabbits and the game bird known as the Ruffled Grouse, and, in this State, wrongly called the "Pheasant." It also occasionally feeds upon poultry during the winter, but is not with us in the summer. It is probable that this hawk is justly under the legal ban, yet horticulturists who are suffering the loss of their trees from the devastation of numbers of rabbits would, indeed, welcome it in their young orchards.

DUCK HAWK

The Duck Hawk (see Fig. 12) once fed almost entirely upon wild ducks, and as these have become very rare, it likewise has become very rare in this State. It now feeds mostly upon small birds and mice. It is one of the most beautiful birds, but so rare that the occurrence of it in Pennsylvania would be justification for scientific record. There is absolutely no need of a law protecting a bird that is so nearly exterminated as the Duck Hawk.

PIGEON HAWK

The Pigeon Hawk (see Fig. 13) is a species of Falcon, and is supposed to be black-balled because it feeds on pigeons and small birds. However, it is a great enemy of mice, rats and young rabbits, and insects, and thus has its good as well as its bad points, with the former predominating. The United States authorities have published "Though they feed on the flesh of birds, they destroy enough insects and noxious mammals to partially offset the injury they do."

The Red-tailed Hawk and Red-shouldered Hawk are among our most abundant of the larger hawk. Both of these are commonly called "Hen-Hawks," but at the present time both are properly on the list of birds protected at all times in the State of Pennsylvania.

THE OWL

Among the Owls that are unprotected are the Great-horned Owl (see Fig. 15) which is sometimes called the "Hoot Owl," and also the Barred Owl. It is difficult to tell why the Barred Owl, the Long-eared Owl, the Short-eared Owl, the Great Grey Owl, and the Snowy owls are not found on this list, together with the two other owls mentioned, but we are glad that the list of owls mentioned is short. It is probable that the Great-horned Owl is legislated against because it occasionally eats poultry and rabbits, but we do know that it is a good rat-killer and a very influential enemy of the Skunk. The Barred Owl is probably on the black list because it occasionally takes rabbits, although it feeds much more upon rats and mice, and is not nearly so serious in its detrimental effects as is supposed. Where poultry is not permitted to roost out in trees, being kept under a roof at night, as they should be, the owls do not harm them. We regard it as more important to protect poultry by shelter than by legislation.

We hope that the other owls named here, as well as the little Screech Owl, which is the enemy of the English Sparrow and house mice, will never be placed on the list of unprotected birds. Gunners should remember that there are more kinds of owls and hawks found in the State of Pennsylvania that are protected by law at all times of the year, than there are that are unprotected.

THE CRANE

Among the wading birds that are unprotected by law, are the Crane, Heron and Bittern. It is impossible to tell just what is meant by the Crane. There are two species of Cranes found in the United States. Both are Southern birds. The Sand Hill Crane lives chiefly in the Southwestern part of the United States, and is not known in Pennsylvania. The White or Whooping Crane (see Fig. 16) is also a Southern bird, and on very rare occasions may stray into Pennsylvania as a straggler. It can be said of it that it eats fishes, frogs and other aquatic creatures, but it is probable that its attacks on fishes are confined chiefly to those that are sluggish and easily captured, or slow-moving species, which, in turn, feed upon the eggs of the wary, quick-moving, spiny-rayed fishes, like the bass, the perch, the pike and their allies. At least, it can be said that the White Crane is altogether too rare and interesting to call for anything else than our most serious efforts for its protection, when it is wafted into this State. apparently by the Southern breezes, and should then become an object of intense interest and study for our school children.

THE HERON

There is no one bird known as the "Heron," and the law does not state that the Herons are unprotected by law. We think it better that it be specific and make a statement as to what species of Herons are to be unprotected. Among Pennsylvania Herons are the Great Blue Heron, the Little Blue Heron (see Fig. 17), the Green Heron, and two species of night herons. All these are wading birds, feeding mostly upon aquatic creatures and taking chiefly more or less soft-rayed fishes. However, the Great Blue Heron has been quite effective as an enemy of gophers and other rodents which live in the ground, and which it has been seen to capture and destroy. From the stomachs of different species of herons, we have taken insects and cray fish to a great extent, showing that they feed on something else than fishes and there is justification, from the economic standpoint, in their preservation.

THE BITTERN

The "Bittern" is a term likewise used in the generic manner, for which there is no one bird. There are two species of bitterns found in this State. One is known as the Indian Hen, or American Bit-

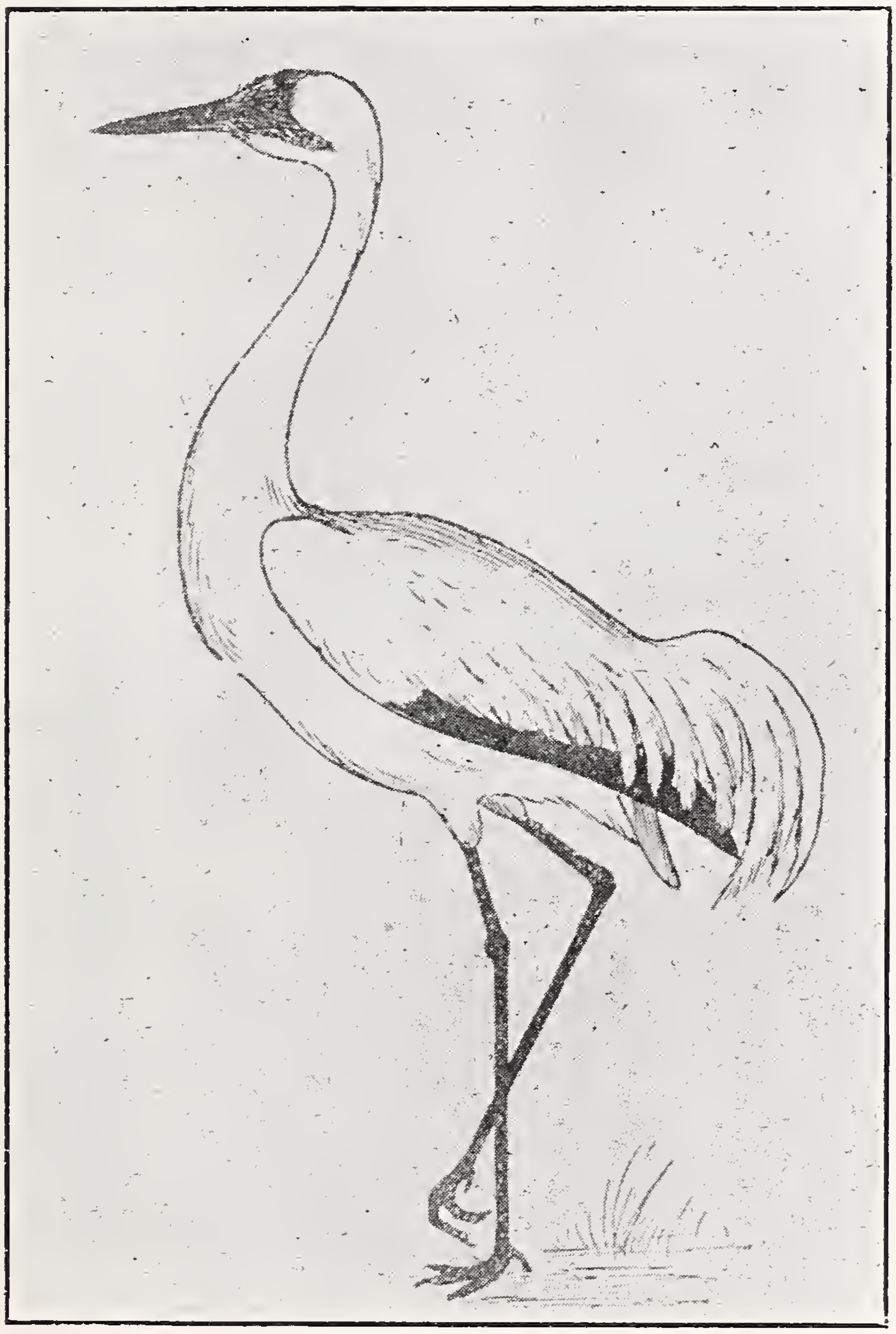

Fig. 16. White Crane.

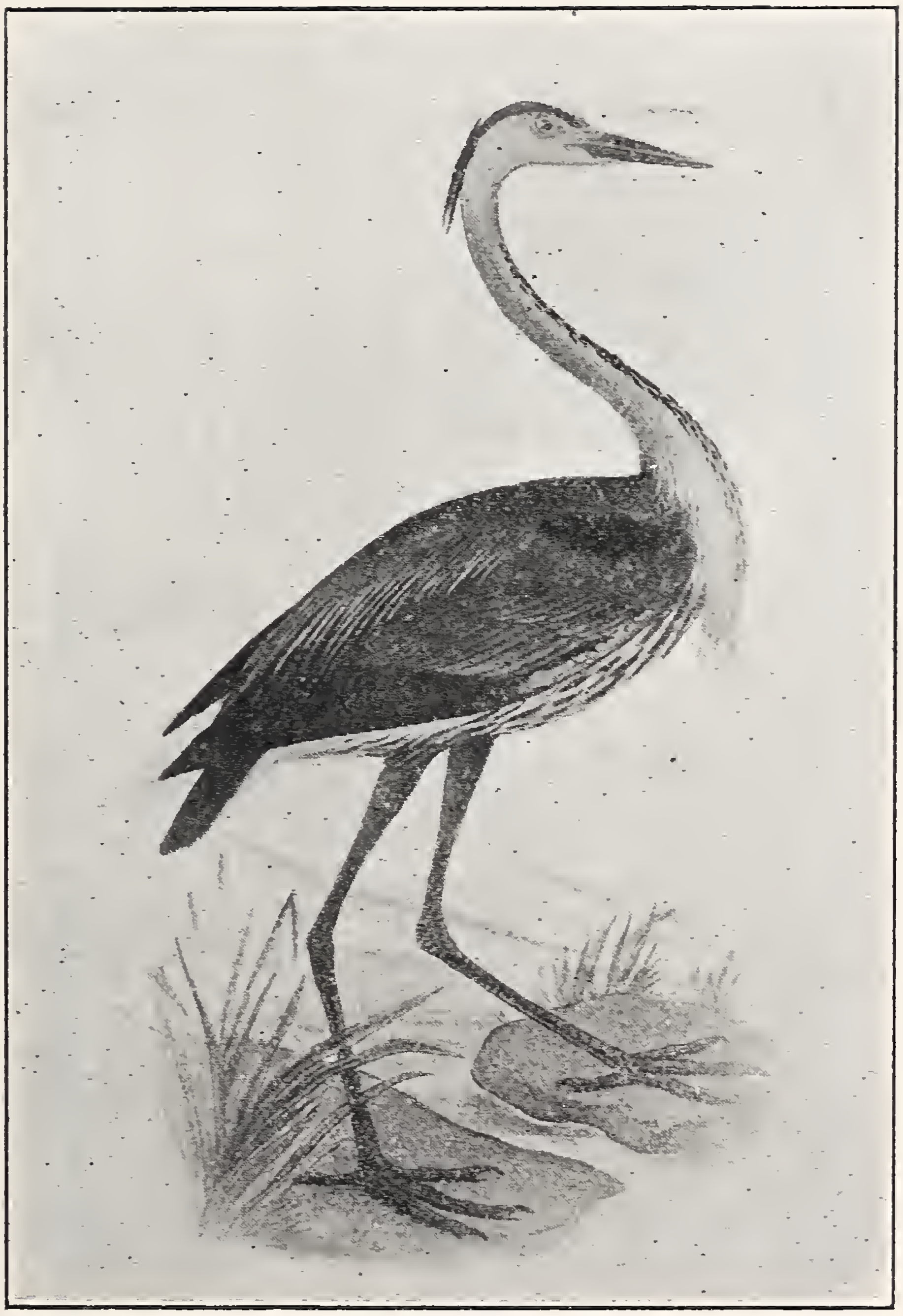

Fig. 17. Blue Heron.

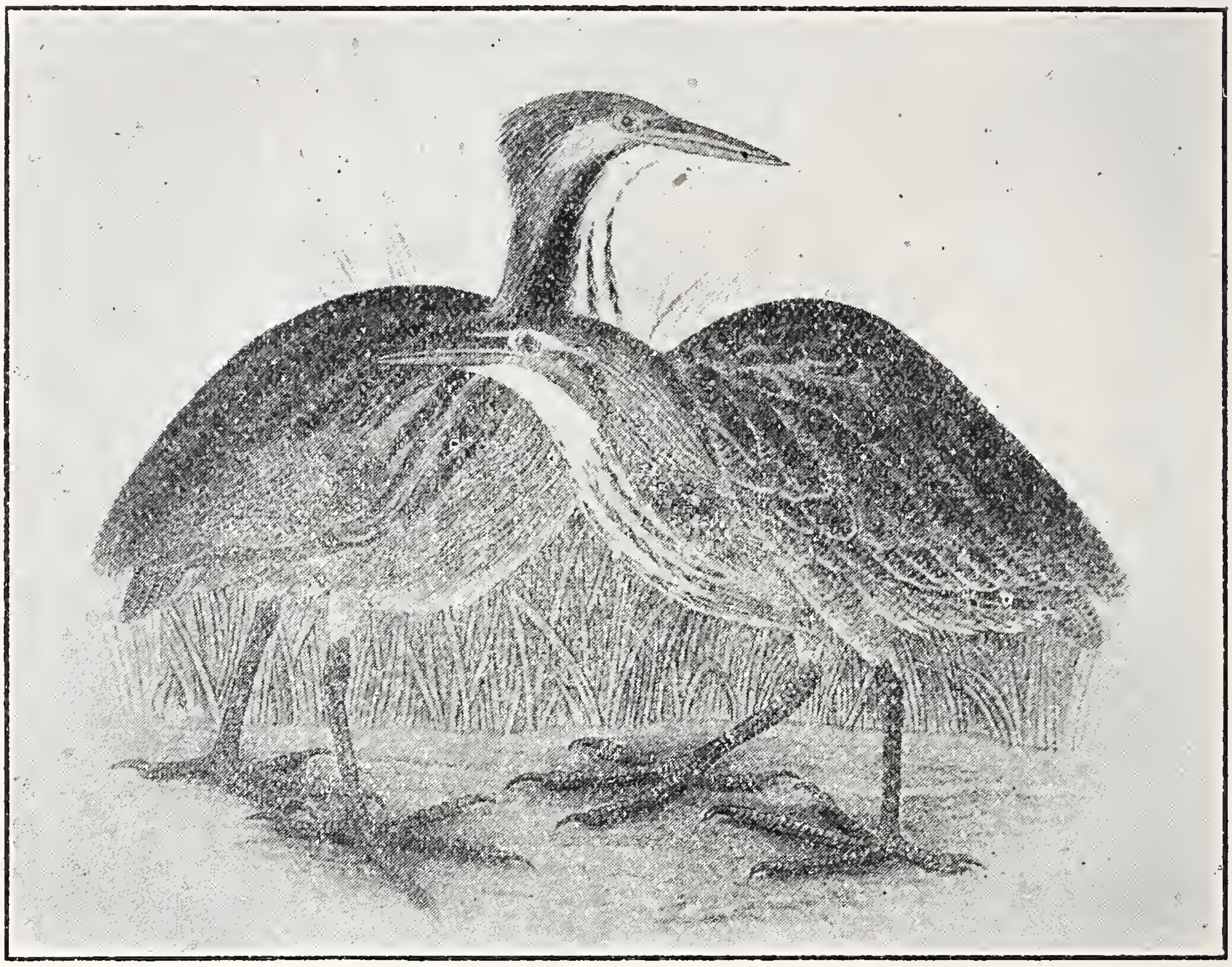

Fig. 18. American Bittern.

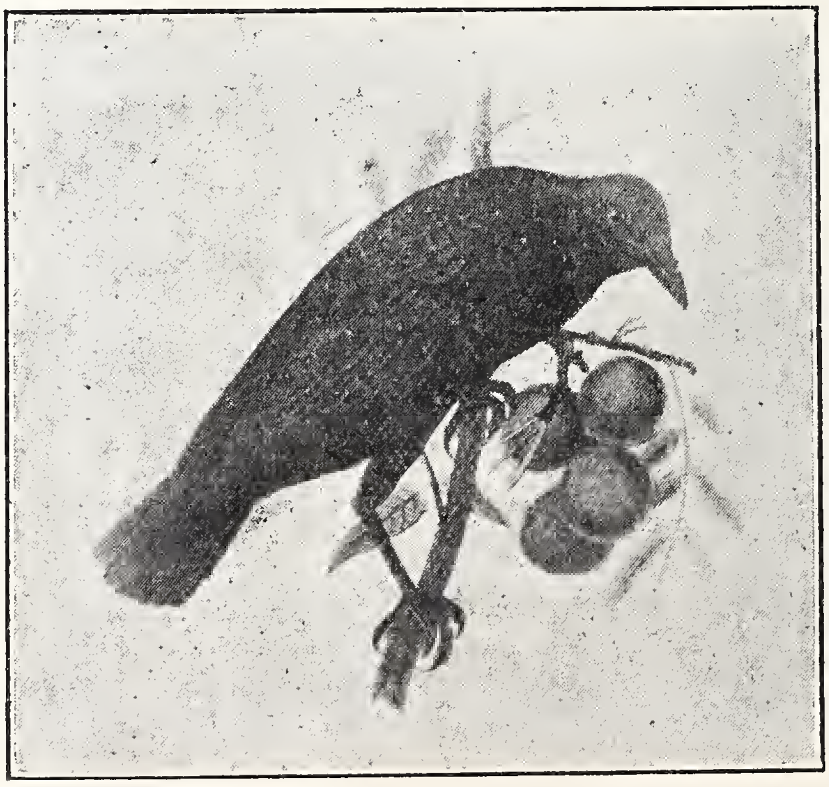

Fig. 19. American Crow.

tern, (see Fig. 18) and the other is called the Least Bittern. Their habits are similar to the various species of herons mentioned, and there is no more justification in exterminating the Bitterns than the Herons.

CROW AND RAVEN

The unprotected list ends with two birds which are, indeed, black in color as well as reputation. These are the Crow and the Raven. (See Fig. 19). We all know that the crow presents a very objectionable habit in eating corn from fields in the spring of the year, and again before it is husked in the fall, but we should likewise realize its value as an insect destroyer. Not many weeks ago, a Mr. Lee, of Bedford county, reported to the writer that last spring, as he was plowing his corn ground, crows in great numbers followed him closely, and would fly from one side of the field to the other, in order to walk in the furrows, and travel over the freshly-turned soil. They were constantly feeding in great numbers. He said that he examined the soil, and found worms, grub worms and wire worms, so very abundant as to be quite alarming, and he felt that he would lose his crop; but he permitted the crows to remain and feed on these insects. Later in the summer it was found that his crop had been effectively protected by the crows well cleaning up the larvae in the soil, while his near neighbors who did not have the crows feeding at the time of plowing, lost their first planting entirely, and were obliged to plant again.

The crow is a suspicious bird, and its injuries to sprouting corn can be avoided by first soaking the corn in water containing a teaspoonful of tar dissolved in each gallon. The bitter taste thus imparted to the corn is enough to make the crows let it alone.

The raven is a rare bird, living only in wild and mountainous regions of this State, and is of such peculiar interest and scarcity as to justify its preservation.

Let us now ask if it is worth while for mankind to attempt to throw his influence in the balance of Nature, as though in his wisdom the twenty species of out-lawed Pennsylvania birds were created in vain. Did not the Almighty create a natural equilibrium, and is it not our duty to maintain it? What is the experience of our farming friends who live where they are best adapted to making observations? Are destructive insects decreasing owing to the suppression by birds and the operation of laws in decreasing the numbers of birds of the kinds above mentioned? Are the song birds and insectivorous birds increasing, due to the absence of these supposed enemies of birds? In regions where hawks and owls are but rarely seen, and, in fact, where the birds mentioned above are less abundant, the song birds and insectivorous birds are likewise most reduced in numbers. Are the ravages by rats and mice growing less? Would not the Balance in Nature be better maintained if mankind would better understand and preserve the enemies of these things? Is it at least not worth while that we should study both sides of the question, even though we may have to acknowledge that our present Game Laws pertaining to birds are about as nearly correct as it may be possible to make them?

This report is to place the other side of the subject of these creatures before the public, showing their place in Nature, which may not have been fully recognized when they were placed in a wholly unprotected list.

While we have based the above report on economic features alone, we should call attention to the ethical and educational value of our birds. Who has not been inspired by the free and open song of a wild bird, now too scarce? Seriously, who would be willing to see the twenty black-listed birds named above forever exterminated in this State. In addition to their cash value, we should make an appeal for the birds on account of the uplift they give us. The bird lover, on the wings of the bird he loves, in some true sense, is lifted up, up, up, where the Alps on Alps rise, to those far heights where he could never climb alone, and this was the feeling in the heart of the poet Bryant, when he watched the wonderful waterfowl take her flight and cried out:

> "Thou'rt gone, the abyss of heaven
>   Hath swallowed up thy form; yet on my heart
> Deeply has sunk the lesson thou hast given,
>   And shall not soon depart.
>
> "He from zone to zone,
>   Guides through the boundless sky thy certain flight,
> In the long way that I must tread alone,
>   Will lead my steps aright."

The CHAIRMAN: What shall be done with this report?

MR. HUTCHISON: I move it be received and published with the proceedings of the Board.

This motion was properly seconded and duly carried in the regular way.

MR. HUTCHISON: I see Mr. Halberstadt has come in.

The CHAIRMAN: We will then take up the Report of the Mineralogist, by Baird Halberstadt, of Pottsville.

This report was as follows:

REPORT OF THE MINERALOGIST

By BAIRD HALBERSTADT, F. G. S.

In the short time allotted, it would be idle to attempt to give an account of all the minerals found within the confines of the great State of Pennsylvania, so abundantly has it been endowed, exceeding in mineral wealth perhaps that of any other state in the Union.

Within it are found the great Anthracite coal fields, exceeding in value and extent those of any known anthracite fields in the world. The Connellsville coking coal, surpasses in value the coal of any other developed region in the United States for the manufacture of coke. Nor have we anywhere in this great country of ours a coal for illuminating gas making purposes that excels or even equals that mined in the Westmoreland-Youghiogheny gas coal region embraced in the western townships of Westmoreland and southeastern townships of Allegheny counties. Many of the mines in Clearfield, Cambria and Somerset counties produce ideal steam coals.

ANTHRACITE COAL

The anthracite region produced in 1910, 75,331,413 long tons which, with that dredged from the rivers (91,833 tons), makes up a total of 75,433,246 long tons or 84,485,236 short tons, whose spot value was $160,275,302, or nearly three times the value of the entire coal product of West Virginia, the second state in rank as a coal producer.

BITUMINOUS COAL

The tonnage mined from the Bituminous coal fields of Pennsylvania in the same year was 150,521,526 short tons or more than double that of its nearest competing state, West Virginia. The spot value of this tonnage was $153,029,510. The spot value of Pennsylvania's total tonnage for 1910 was $313,304,812, while that of the United States was $629,557,021. Pennsylvania produced 46.8 per cent. of all the coal mined in the United States in 1910. The tonnage of the entire country was 501,596,378 tons of which amount Pennsylvania produced 235,006,762 short tons or more than three and a half times as much as any other state. In fact, the production of coal in Pennsylvania in 1910 exceeded the combined tonnage of West Virginia, Illinois, Ohio, Indiana, Alabama, Kentucky, Colorado, Iowa, Wyoming, Tennessee, Virginia and Missouri by over 50,000 tons. To mine, prepare and ship this tonnage of Pennsylvania required an army of 344,900 men and boys.

It is more than of passing interest to know that the United States mines nearly 40 per cent. of the annual output of the entire world. Pennsylvania and West Virginia produced more coal in 1910 than Great Britain; Pennsylvania's production was but 10,036,538 tons less than that of Germany.

COKE

Pennsylvania produced in 1910 more than 60 per cent. of the entire coke output of the United States, its production being 26,315,607 short tons, valued at $55,254,599. The quantity of coke manufactured in the United States was 41,708,810 short tons, valued at $99,742,701; more than 50 per cent. of all the coke ovens in the country are in Pennsylvania.

PETROLEUM

Although Pennsylvania produced the first petroleum on a commercial scale from a well at Titusville in 1859, and long remained the leading oil producing state, it has dropped from the first to the seventh in rank of oil producing states.

The total production of petroleum in the United States in 1910 was 209,556,048 barrels, valued at $127,896,328. Of this amount, Pennsylvania produced 8,794,662 barrels, valued at $11,908,914. Although seventh in rank as a producer, Pennsylvania stands fifth as to the value of its product.

Up to 1876, Pennsylvania and New York were the only states producing petroleum on a commercial scale. In that year, Ohio, West Virginia and California took their places as producers. These were followed by Kentucky and Tennessee in 1883, Colorado in 1887, Indiana and Illinois, Kansas, Texas and Missouri, Oklahoma in 1891, Wyoming in 1894, Louisiana in 1902.

California (34.84 per cent.), Oklahoma (24.83 per cent.), Illinois (15.82 per cent.) in 1910 produced over 75 per cent. of the entire petroleum output of the United States. In 1859, the total production of petroleum in the United States was but two thousand (2,000) barrels.

The production in 1910 was over one thousand times greater than it was in 1859, and in value had jumped from $32,000 to $127,896,328.

NATURAL GAS

The production of natural gas of the United States in 1910 was 509,155,309,000 cubic feet; its value was $70,756,158. The production of this valuable fuel in Pennsylvania amounted to 126,866,729,000 cubic feet, valued at $21,057,211.

In addition to the enormous production of her own, Pennsylvania consumed over forty-two billion cubic feet drawn from other states. It will be observed that the value of gas produced in Pennsylvania was nearly double the value of the petroleum produced in the State in the same period.

IRON ORE

The production of iron ores in the United States in 1910 amounted to 56,889,734 long tons. Of this amount, Pennsylvania produced 739,799 tons as follows:

Hematite, 846 tons; brown ore, 106,544 tons; Magnetite, 632,409 tons. The production of hematite in 1910 was but 16.4 per cent. of the production in 1909. The brown ore production showed an increase of 25,829 tons. The production of magnetite showed an increase of 51,379 tons in 1910 over the production of 1909.

The value of iron ore mined in Pennsylvania in 1910 was $911,847. Minnesota, Michigan and Alabama produce over 88 per cent. of the total production of the country.

Pennsylvania's quota was but 1.3 per cent. of the whole.

With the single exception of New Jersey, Pennsylvania produced more magnetite than any other state in the Union. This ore mined at the Cornwall ore mine in Lebanon county formed 24 per cent. of the entire production of the United States for that year.

As an iron ore producing State, Pennsylvania is seventh in rank, but in the value of product, it is outranked by eight states.

ZINC

Although there are many localities in the State at which zinc blende is found, I find no return made of this as a commercial product in 1910, from Pennsylvania. The New Jersey Zinc Company has an extensive smelting plant at Palmerton, but the ores smelted are mined in New Jersey.

COPPER

Several mines in Adams county are reported as producing copper, while in Lebanon county, blister copper is produced at the Cornwall iron ore mine. The production amounted to 740,626 pounds. There were produced, in addition to this amount from all sources including old slags, smelter cleanings, precipitates, etc., 186,734 pounds, making a total production in the State of 927,360 pounds. If the average price per pound (12.7c) be used as a basis, the value of the copper production of Pennsylvania in 1910 was $117,774.72.

GRAPHITE

During the year 1910, Pennsylvania produced 696 tons of crystalline graphite, valued at $82,194. This product was mined in Chester county. Graphite was formerly mined at Boyertown and Mertztown but these mines are, at present, not producing.

STONE INDUSTRY

Pennsylvania leads all other states in value of its production of stone of various kinds. These include Granite, Trap Rock, Marble, Sandstone and Limestone. The value of its limestone product exceeded that of any other state. The total value of the various kinds of stone produced in 1910 was $8,621,937 as against $76,520,584, the value of the production of the United States; Pennsylvania's quota being 11.27 per cent. of the whole.

FELDSPAR

The production of feldspar in Pennsylvania in 1910 was 15,091 tons, valued at $104,751. The mining of feldspar in Pennsylvania is confined to Chester and Delaware counties.

QUARTZ

The quartz industry of Pennsylvania is confined to Adams and Chester counties, there being in 1910 but two producers, the Columbia Flint Company of Marietta, and H. T. A. Rhodewalt of Chester county. The quality and value of the product mined are not available for publication, but the combined production of Pennsylvania and Maryland was 13,588 tons, valued at $71,864.

SAND AND GRAVEL

The sand and gravel produced in the United States in 1910 amounted to 69,410,436 tons and was valued at $21,037,630. Of this amount, Pennsylvania produced 5,676,509 tons, valued at $2,974,221. The quantity of the said was 4,253,163 tons valued at $2,607,215. Of gravel, there were produced 1,423,347 tons, valued at $367,006.

The classification of the sands is as follows: Glass-sand, Moulding, Building, Fire, Engine, Furnace and other sands. More sand and gravel were produced in 1910 than in any year previous to this.

PORTLAND CEMENT

In 1910, the total production of Portland cement in the United States was 76,549,951 barrels, valued at $68,205,800. Pennsylvania is again in the front rank, its production being 26,675,978 barrels, valued at $19,551,268. It produced over three times as much Portland cement as its nearest competitor (Indiana).

NATURAL CEMENT

The output of Natural cement has rapidly declined and will probably continue to do so until better methods of treatment can be found whereby the natural cement can be made equal in tensile strength to that of the best grades of Portland cement.

In the production of Natural cement, Pennsylvania produced but 196,331 barrels as against 304,598 barrels produced in New York. But ten (10) states produce Natural cement as against twenty-six (26) producing the Portland brand.

PUZZOLAN CEMENT

The production of Puzzolan cement, prepared by mixing slaked lime and furnace slag is, like the Natural cement, declining. Of the four (4) plants reported, one of these is in Pennsylvania. As there is but a single plant in Pennsylvania, neither its production or value of its product can, for business reasons, be given.

CLAY PRODUCTS

The total value of the clay products of Pennsylvania in 1910 as shown from the reports of the Clay working industries was $22,094,284. Ohio was the only state whose products exceeded in value those of Pennsylvania.

Brick, including the common, vitrified and front varieties, were manufactured to the number of 1,101,448,000, valued at $8,578,389. The value of the fire brick produced was $6,545,928, or a combined value of all variety of brick, except the enameled, of $15,033,317.

SLATE

The value of roofing, mill stock and other slates produced in the United States in 1910 was $6,236,759. The value of Pennsylvania's production was $3,740,806 or nearly 60 per cent. of the whole. Pennsylvania not only stands first in the rank of producers but her product exceeds in quantity and value that of all other states combined.

The four counties from which this product is quarried are Northampton, Lehigh, York and Carbon. The school and blackboard slates are produced only in Lehigh and Northampton counties, because of the fine cleavage of these slates for this particular purpose.

The slate quarried in Carbon and York counties is used for roofing purposes, while that of both Lehigh and Northampton can be utilized for both roofing slate and mill stock.

TALC

Talc was mined and shipped by three operators in Pennsylvania whose plants are all in the same vicinity. New Jersey has but a single operator. The combined tonnage of Pennsylvania and New Jersey in 1910 was 13,192 tons, valued at $62,833. The greater part of this tonnage was mined in Pennsylvania.

MINERAL PAINTS

Ochre

The production of ochre in 1910 in this country was 11,711 tons, valued at $112,445 to which amounts Pennsylvania contributed 3,642 tons, valued at $32,254 or 31 per cent. of the quantity and 29 per cent. of the value.

The total quantity of Umber and Sienna mined in the same period was 1,015 tons, the greater part of which was produced in Pennsylvania.

The production of metallic paints in Pennsylvania was 8,063 tons, valued at $91,714.

Pennsylvania produced of mortar colors 2,711 tons, valued at $33,752, as against 9,960 tons, valued at $107,780 for the entire country.

SLATE AND SHALE

A considerable quantity of slate and shale are annually ground up for use in pigments and as fillers. In 1910, the individual figures of State production are not available; Pennsylvania's production, however, places the State in the front rank.

MINERAL WATERS

From forty-four springs in various counties of the State, Pennsylvania produced in 1910, 2,536,337 gallons of mineral water, valued at $221,685.

The standing of Pennsylvania is as follows: In the number of springs, third (3rd), quantity sold, fifth (5th); in total value, eighth (8th).

SALT AND BROMINE

A considerable quantity of both salt and bromine were produced in Allegheny county, Pennsylvania, but unfortunately, both the quantity and value are not available for publication.

LIME

Pennsylvania, in 1911, burned more lime than any state in the Union; Ohio ranking second with a production of less than one-half that of Pennsylvania.

The quantity of lime burned in the United States was 3,481,780 short tons, valued at $13,894,962. This was produced by 1,125 operators. Pennsylvania's contribution made by 572 operators was 877,714 short tons, valued at $2,440,350.

The average price per ton was $2.78, as against an average of $3.99 for the entire country. The highest price per ton was $9.65, the average price of lime in Oregon.

POTASH SALTS.

It will be interesting to the farmers of Pennsylvania to know that an investigation has for some time and is still being pursued to learn of any and all sources in the United States from which potash can be derived. It is to be hoped that a successful termination of the investigation will occur and that our country will supply all the demands and that recourse may not be then necessary to import this needful fertilizer, so necessary to the farmer, from foreign lands.

The figures given in this report have been derived from the Division of Mineral Statistics of the U. S. Geological Survey.

The CHAIRMAN: What is the pleasure of the Board on this report?

MR. HUTCHISON: I move it be received and published with the proceedings.

This motion was properly seconded and duly carried in the regular way.

The SECRETARY: There is another item on the program which is of great importance to the people of Pennsylvania, and I hope every one will remain to hear what Prof. Cochel has to say about the raising of beef cattle in Pennsylvania. The time has come when I think Pennsylvania farmers will have to turn their attention in this direction, and for that reason Prof. Cochel has been asked to give us this report.

MR. JOEL A. HERR: The Memorial Committee is ready to report at this time if it be the pleasure of the Board.

The CHAIRMAN: We will have the report of the Memorial Committee.

This report, read by Mr. Joel A. Herr, is as follows:

REPORT OF THE MEMORIAL COMMITTEE

Harrisburg, Pa., Jan. 25, 1912.

Again we are called upon to record the removal by death of two of our associates in the agricultural field of our State, Gabriel Hiester, of Dauphin county, and J. F. Johnson, of Fulton county.

Gabriel Hiester was born on the ancestral acres on which he died, April 28, 1850, his death occuring January 19, 1912. He was graduated at Pennsylvania State College in 1868 at the age of 18 years. His father was one of the founders and until his death, one of its honored trustees. Mr. Hiester was graduated in the course in Agriculture and returned to his father's farm and carried on advanced general farming, specializing in Pomology, in which he became an authority.

He became a member of the Pennsylvania State Board of Agriculture, also a member of the then Fruit Growers' Association in 1882, serving in the Board for many years as a member and officer, and for many years as its Pomologist. He continued a member and was President of the State Horticultural Society at the time of his death.

In addition to the original homestead, he purchased a farm in Perry county, Pa., and converted it into a fruit farm in which he succeeded in growing apples and peaches and cherries, giving an important object lesson to our fruit growers.

He has been a prominent Trustee of Pennsylvania State College since 1879, and served for many years on its Executive and Advisory Committee. His was a master mind which was shown in every line of work he pursued.

When the history of Pennsylvania agriculture is written, the name of Gabriel Hiester will be in the foremost rank of its progressive members.

He was a man of unbending integrity and a high sense of honor; courageous and aggressive, yet courteous and affable, he possessed the qualities of a great leader. His death is not only a loss to the Board, but to the entire State.

Mr. J. F. Johnson was an active member of this Board for two consecutive terms, a prominent citizen and farmer of Fulton county. He died at his home, in February 1911, aged about 54 years. While a member of this Board, he was a regular attendant and interested in its work.

We desire to express our loss by the demise of these co-workers, and extend our sympathies to their bereaved families.

We ask that this report be spread upon the minutes of this Board and a copy be sent to the bereaved families.

J. A. HERR,
JAS. A. BEAVER,
A. J. KAHLER,
HENRY C. SNAVELY,
MATTHEW RODGERS,
Committee.

SECRETARY CRITCHFIELD: It was my pleasure to know both of the gentlemen who have passed away within the last year, and in regard to Mr. Hiester, I may say that I knew him very well. It has been my privilege to meet him at a number of public gatherings, and I also have had the pleasure as well as privilege of meeting him repeatedly at his own home.

Mr. Hiester was, as has been already said, a gentleman in his instincts and manners, a man whom no one could know well or intimately, without having been made better by acquaintance and association with him.

He was a great lover of Nature, and wherever he went, he could see something to admire—the fruit and flowers, the mountains, the great gulches cut through them and the beautiful river that flowed by his home were full of interest to him. He often called my attention to them and spoke of their rugged beauty. All these were pictures that to him were worthy of special admiration and attention.

Mr. Hiester was a true friend. I doubt whether I ever knew a man who was more loyal and devoted to his friends than he; and while he loved to attend the meetings which it was his official duty to attend, on account of the opportunity it afforded him to serve the generation to which he belonged, he also appreciated the privilege it afforded of meeting his friends.

As a husband and father, he was devoted and affectionate. All his thoughts seemed to embrace the good of those who belonged to his household. I have been to his home since the illness of his wife, which has been very severe within the past few months, and I noted the tender regard he manifested for her and his constant solicitude for her comfort. Before the last meeting of the Trustees of State College I called on him personally to see if he could go to the meeting. I knew how much he delighted to be there, how he loved his Alma Mater, and how dear to him were all her interests, but he said, "Mr. Secretary, there is nothing that would give me greater pleasure than to go, if all was well at home, but my duty at present is here with my afflicted wife." It may be said, therefore, that he possessed that best of all traits—deep, earnest affection for those who, under God, were placed in his charge.

I feel that in the death of Mr. Hiester I sustain a personal loss. No man who has a proper sense of duty can occupy a place of responsibility without feeling the importance of having some one near at hand, in whom he has confidence, to whom he can go for counsel. On more occasions than one, have I gone to Mr. Hiester, to talk over with him and get his view upon some matter of interest to the Department that is under my charge, and I always found him ready to lend his counsel and aid.

It gives me pleasure to bear this testimony to the noble qualities of our departed friend.

We shall all miss him; if we who only occasionally had the privilege of grasping his hand and receiving his cheerful salutation, so regard our loss, who can estimate the burden of grief that has fallen like a shadow over his home, crushing the hearts of those who were near to him by the ties of nature and constant association, and it is most fitting that in these resolutions we express our sympathy for his loved ones left in the home that is made desolate by the great loss that has come to us all.

MR. A. P. YOUNG: I have a tribute I should like to bring. It is a little poem I have admired ever since my schooldays:

"There is no death! The stars go down
To rise upon some fairer shore:
And bright in heaven's jeweled crown
They shine for evermore.

"There is no death! The dust we tread
Shall change beneath the summer shower
To golden grain or mellowed fruit,
Or rainbow tinted flowers.

"The granite rocks disorganize,
And feed the hungry moss they bear;
The forest leaves drink daily life
From out the viewless air.

"There is no death! The leaves may fall,
And flowers may fade and pass away;
They only wait through wintry hours
The coming of the May.

"There is no death! An angel form
Walks o'er the earth in silent tread,
He bears our best loved things away;
And then we call them 'dead.'

"He leaves our hearts all desolate
He plucks our fairest, sweetest flowers:
Transplanted into bliss they now
Adorn immortal bowers.

"The bird-like voice whose joyous tones,
Makes glad these scenes of sin and strife,
Sings now an everlasting song
Around the 'Tree of Life.'

"Where'er he sees a smile too bright
Or heart too pure for taint or vice,
He bears it to that world of light
To dwell in Paradise.

"Born into that undying life
They leave us, but to come again,
With joy we welcome them—the same
Except their sin and pain.

"And ever near us, though unseen
The dear, immortal spirits tread,
For all the boundless universe
Is life—there are no dead."

MR. HUTCHISON: Mr. Hiester was one of my best and truest friends. I have known him for many, many years. We were thrown together quite a good deal. Our sons were schoolmates at College, they graduated in the Class of '98, his only son and my oldest son. His son visited my house and a friendship sprang up between the two boys, and led to a friendship between the fathers. He has been at my home. I traveled with him over the State to the Farmers' Institutes. I loved the man. I knew him very well. He always had a good word for everyone. I never heard him say an unkind word to any one. If he could not say a good word, he said nothing.

He was an authority on fruit culture. His name was known not only in our own State, but in adjacent states. His death is a distinct loss to the Commonwealth. I regretted when he left the Institute force, but he felt he could not leave his wife and daughters alone and travel over the State. He was a true friend in every way, and a true friend to State College, and what a loss to the College is his death! His father, as has been said was one of the earliest trustees of the College, and the son followed his father. He was much interested in the orchard established there, and took great pride in its development. But he has gone. We cannot bring him back. The only thing we can do is to endeavor to go where he is, and see him in another and happier world.

MR. JOEL A. HERR: I presume there is not one present who has had as long an acquaintance with Gabriel Hiester as myself. When I first came on the State Board of Agriculture in 1879, Mr. Hiester was quite a young man, but even then interested in fruit culture. Naturally this formed an opening wedge of the friendship between us and I always regarded him as a man of authority along these lines. I have visited him at his home and traveled with him to Farmers' Institutes. We have had him in my own home County of Clinton at Farmers' Institutes. He was one of the most sensible, high-minded, and yet affable and agreeable men I have ever known. He could not be approached with anything that was not entirely correct and proper. I doubt whether his word was ever questioned.

Everything he said, "went" and his neighbors all over the county looked up to him as a leader among men—which he certainly was. We don't appreciate what we have lost. Who is there in Pennsylvania to take his place? We have other good fruit men—men who make extravagant statements. You never heard Hiester make an extravagant statement. Whatever he said was plain, straight fact. He seemed to my mind, to possess all the elements of a great man, and the greatest pity is that he could not have lived—that he died in the prime of his manhood. He could have been of immense use to the Horticulture of this State, and I join in regret for his departure.

DR. HARVEY: Let me add, that while I did not know Mr. Hiester as well as some of you, I met him at some of our meetings and was very favorably impressed with him. He seemed to me to be a man to whom could truthfully be applied the words of Shakespeare:

"His life was gentle, and the elements so mixed in him, that all Nature might stand up and say 'This is a man.' " I have often heard a man say—a most eloquent preacher from Texas—"Oh, I like a *man*!" And that is all there is to this world, if we have a man's head and a man's character. We know, furthermore, that God has His own, and we will know them wherever they are. I came across a few lines the other day, which impressed me very strongly:

"He who believing strongly lays his hand
Unto the work that waits for him to do.
Though men should cavil, measures prove untrue
Friends write their trusted promises on sand
And failure mock him with its threatening hand,
Still, in the end, he fearless shall pursue
Till crack of doom, will find a power which few
Or none with cause less righteous may command.
For conquest is not built on the defeat,
Of any man whose aim is human good,
Who fights for justice hath already won,
Before no show of loss shall he retreat.
However crossed, maligned, misunderstood
He knows but triumph, in the work, well done."

The CHAIRMAN: What shall be done with this report?

The SECRETARY: I move it be received and published in the journal of the proceedings.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: Now we will have the pleasure of listening to Prof. Cochel.

Prof. Cochel spoke as follows:

ADDRESS OF PROF. COCHEL

Whenever a man has the labor and facilities that will permit him to go into the production of dairy products, it would certainly be a foolish thing to change from the production of dairy products to beef. On the other hand, we find in many other sections of the

State that are deficient in labor and have larger divisions of farm land that they can properly cultivate. They have large areas that are, or should be, devoted exclusively to grass.

We have a market and a climate that is especially adapted to the cultivation of beef, hence, we should under these circumstances go into the production of beef on a marketable basis, always taking into consideration that the cow that is cultivated as beef is turning the crops into a more marketable product, increasing the humus of the soil, and enabling us to utilize what would otherwise be waste products into a profitable part of the farm. In other words the beef cow changes waste areas into a marketable form.

Now, in studying beef production we divide it into two classes: one class produces feeders for the market, the other produces the marketable steer in the more finished form. The reason for this is that the sections of the State that are especially adapted to the production of feeders, do not, as a rule, grow a sufficient amount of crops to turn them into the finished product. Where we have the rough finished lands that are not capable of being plowed to any extent, we can raise our feeders on roughage, largely. On the other hand, where we have land that is too valuable to be turned into pasture, people naturally turn into finishing the beef for market.

We find that in the development of this State, and other stock states, the cattle imported from Europe were of the beef type. They were imported because they were especially adapted to the needs of that time. Later, when the country became more closely settled in Pennsylvania and Ohio and Illinois, the people of Pennsylvania quit raising beef cattle. They went to the Western prairie states for their feeders, and finished them for the market. Later the people of Ohio and Indiana did the same thing, depending on Iowa and Nebraska and other Western states to produce cattle for Pennsylvania and Ohio and Illinois. A little later the Middle West went out of the beef production and it moved onward toward Western Kansas, Montana, Wyoming and the Western Mountain states.

A large percentage of the cattle finished in the corn belt of the United States, are produced west of the Missouri, rather than east of it. At the same time, the demand for feeding cattle is becoming larger in Pennsylvania, Ohio and even as far West as Iowa. Consequently the supply has not kept pace with the demand, while the market price has more than kept pace, so that the feeders of Pennsylvania are not complaining of the price they get for the finished product.

In the spring of the year the market was especially well priced for the finished product. At the same time there was a deficiency in cheap and relatively unfinished cattle, so that cattle that required only two months more feeding to finish them properly, brought twenty-five cents a hundred less than that finished up to the standard. That was about the condition of the market which made all our cattle go into market faster than they could be made; later on in the year there was hardly a time when the finished cattle could not be shipped into the Chicago market at a higher price than ever before. In the Pittsburg market they quoted beef from the blue grass cattle at eight dollars per hundred advance. The demand therefore is, not only for beef cattle, but for beef cattle of a correct type ready to meet the market demands. It shows the tendency toward the production of beef in our State. Our breeders and our feeders now are beginning to aim their attention to the production of beef cattle in Pennsylvania. I have been in Pennsylvania a little over two years and just now we are receiving more letters in regard to the raising of beef cattle in Pennsylvania in a week than we did during the entire year I was at college. Within the last month one farmer at least, and very likely two, have established the nucleus of a beef herd in Lancaster county, so that the tendency is to produce more beef cattle than ever before.

Now, the question is whether these men will be justified in the change. During the last twenty-five years there has been a tremendous change in the beef market. Take an average of five years periods in the Pittsburg and Chicago markets, we find at the end of each five years that the cattle were worth more, and the demand was larger than during the preceding five years. So that the price of cattle is increasing and at the same time our soils in Pennsylvania, and in the West, are increasing in fertility and the tendency is to put more animals on the farm and put back the fertility, and at the same time use up the roughage. When we pay more attention to the question of soil maintenance, we will have a great many more cattle than we have at the present time. At the College we have now twenty pure bred beef cows that we are trying to handle in the most economical method possible, and see whether it will pay in Pennsylvania to keep a cow for the calf she produces. We are feeding them a ration of corn silage and cottonseed meal—about forty-five to fifty pounds of silage and one pound of cottonseed meal per head daily. Since the first of December they have gained a trifle over a pound a day per head, which shows that they are not only maintaining themselves but are putting more fat on their bodies. Throughout the summer they will be granged without grain, and in the meantime we are feeding two market lots, one of which is given all the cottonseed meal they can eat, without grain, and the other is put on a grain ration with corn silage and cottonseed meal. You will notice we have absolutely discontinued feeding hay to our market cattle this year.

This is not because hay is not good, but in our local market we have hay selling for from twenty-four to twenty-six dollars per ton, while silage is costing us less.

MR. FENSTERMAKER: How much less?

PROF. COCHEL: We estimate that one of corn is worth three of silage on the market basis.

Last year was a disastrous year for the men who fed beef cattle. We fed five lots at the Station, and we found that not a single one paid for themselves and the feed they consumed, unless we give some value to the manure. The average price we received for our corn in this form was a little over a dollar a bushel, while it cost us sixty cents.

So in making up our minds as to the value of the crops raised on the farm, we should take it through a series of years rather than one year, like last year, when it would show a loss, while the previous year would show a profit, but take an average of five years. In tabulating the published results from the different experiments for the last five years, we find that corn has brought an average of twenty cents per bushel more when fed to beef cattle than when put on the market in its original form. The hay has been credited at its full farm value. So, taking a series of years, we get a more correct return than by taking it for one year only.

During the Livestock Show at Pittsburg, they had a fine display of the beef breeds—Shorthorn, Angus. Hereford, and Galloway, and in them all was noticeable that the uniformity of breed and finish, that is typical of the beef standard, which is bred for the purpose of being slaughtered without much waste.

Now that is what we must expect to produce in Pennsylvania. We can't expect to produce good beef cattle from a scrub cow. We must produce a type of the beef class.

Now, as to what feed. There must be an amount of roughage in proportion to the quantity of grain, alfalfa, hay, corn silage, clover hay. The steers will soon get fat enough to sell to our local butchers, but if we expect to ship to the Central Market and expect to sell at the best market price, we must produce the market type, and feed in the cheapest manner possible. To feed corn at the present market price, is almost certain to result in a loss.

MR. SHOENER: How much corn do you feed, and how long?

PROF. COCHEL: One pound of cottonseed meal and all the silage they would eat for approximately two months. When they begin to put on some fat and we want to get them into a satisfactory condition to sell we give them one and one-half pounds of corn for each hundred pounds they weigh—that is the ear corn, and they you increase in proportion as they increase in weight. A two thousand pound steer would eat approximately twenty pounds of corn. We have no difficulty with the market this year; we can buy corn at any approximately less price than we can buy hay, so we find it advisable to feed corn.

MR. MARTIN: Do you consider it more profitable for the man who wishes to go into the feeding business to breed his cattle or to buy them?

PROF. COCHEL: It will depend entirely upon his ground. If he had rough ground and can produce grass, it will be all right to breed his cattle; but in a section of country where he can produce corn, let him feed them. If he finds it advisable, he can do the two.

MR. MARTIN: In this system of soiling, could clover hay be utilized in breeding?

PROF. COCHEL: If a man had the labor he could do better by going into the dairy business. For instance, at the College we have one man who is weighing out the feed that one hundred cattle consume, and in addition, he attends to about one hundred sheep and fifty hogs. In the barn we have three men attending to fifty cows. I think you will notice, if you study the dairy business, that the men who make a profit out of the dairy business, are men who have large families, and each member of the family has certain work to do, and they are not given credit for this work. He generally counts that he has only to pay one man a dollar and a half a day and his board. I think you will find, if you study the question, that, as a rule, the man who runs a dairy farm, is a man of family, while the man who has the rough land and breeds cattle is generally a bachelor.

MR. MARTIN: How do you account for that?

PROF. COCHEL: It doesn't require so much work. Dairy men are usually married men, and have large families. Now, carrying it a little further, you will find that the man who runs a truck farm, near a large city, must have a large amount of labor, and he is usually a married man, also with a family to help him. The raising of beef cattle can be done with little labor. The cattle take care of themselves when the man is busy, because they are on grass, and in the winter when the crops are stored in the barn there is where your handling of beef cattle comes in. I think it is largely a question of labor, whether a man wants to raise beef cattle, or go into dairying.

A Member: Could you not cheapen your feed a little if you could raise your own concentrates—say soy beans and have them ground into meal? Would that have a bad effect?

PROF. COCHEL: No, it would not have a bad effect, but it all depends upon whether you could produce something that would be of more value. I would say, however, that if you could raise alfalfa hay, you would get just as good results in feeding, and add more to the value of the hay.

MR. J. ALDUS HERR: Would not alfalfa and silo make a good ration?

PROF. COCHEL: No, not for a beef steer. Ordinarily, for the scrub cattle it would, but there is where your beef cattle goes ahead of the ordinary cattle. You take a dairy cow that is producing fifteen to twenty pounds a day; if you expect her to produce forty to fifty pounds, you must expect to add to her ration, and if you expect to add a large amount of fat on a steer you must feed concentrates. If you are trying to grow a frame, you can feed him almost entirely on roughage.

MR. MARTIN: Do you find that the four different varieties of beef cattle give better results on the same feed than the other kind do?

PROF. COCHEL: Yes, sir; if you study them you will see that the Angus type to almost perfect marks. The Hereford are the best grazers, and the Shorthorns are a little larger than either of the other two breeds, and will dress almost as well, and produce almost as much as the other two.

The SECRETARY: What about the Galloways?

PROF. COCHEL: They are especially adapted to a rough, mountainous country, where they have to hustle a little bit more for their living. Under our Pennsylvania conditions it is not considered very profitable, and it is the one herd of beef cattle that has actually decreased in the last ten years in the United States.

The SECRETARY: Are they better hustlers?

PROF. COCHEL: No; but they seem to be able to stand a little more without injury to their health.

The CHAIRMAN: At what age do you consider it most profitable to fatten your own steer?

PROF. COCHEL: At about fifteen to eighteen months, if you are producing him; if you are buying him from some other section, and feeding him, they are more profitable at two years old, because they have a large frame, on which to build, and they fatten a little more quickly than a younger animal in the same time.

MR. HOLMAN: Soy beans ground takes the place of cottonseed meal?

PROF. COCHEL: Of course.

MR. WEIMER: How long should the milk be given to the calf, if you produce the calf yourself?

PROF. COCHEL: Let a calf suck the cow for six months or even as long as she gives milk. A calf six months old should weigh six hundred pounds, and yet you will see them suckling as lustily as the little fellows.

MR. WEIMER: You practically allow them to wean themselves?

PROF. COCHEL: Yes, sir; when I was at the Indiana Experiment Station, we worked on several experiments. We took six calves weighing approximately three hundred pounds to the Chicago market, they averaged us twenty-five dollars per head, and we sold the lot for seventy dollars.

Now the man raising his own cattle can save about two months in feeding. They should weigh approximately a thousand pounds when they go to the market.

Are there any other questions? I thank you for your attention.

The SECRETARY: I will call the roll again at this time, if any of you know of members who have been here but may not now be in the room, I wish you would answer for them in order that our record of attendance may be correct.

The result of this roll call is included in the record of attendance as given earlier in the journal of the proceedings.

COL. WOODWARD: Are you ready to receive the Report of the Committee on Resolutions at this time, or not?

The CHAIRMAN: What is the pleasure of the Board? There seems to be no objection, so we will let it be heard.

Col. Woodward read the report of the Committee on Resolutions as follows:

REPORT OF COMMITTEE ON RESOLUTIONS

RESIDENT HUNTERS' LICENSE.

Resolved, That we approve the passage of the bill, known as Senate Bill No. 407, or a similar bill which provides for the exemption of the land owner from the necessity of procuring a Hunter's License.

Provided, also, That any bona-fide owner of lands in this Commonwealth or the bona-fide lessee of lands within the Commonwealth, such person being a citizen of the United States and a resident of this Commonwealth or the child of such owner or lessee, shall, during the open season for game in the Commonwealth, have the right to hunt game upon the lands so owned or leased without securing the license prescribed by this act.

For the purpose of this act the fact that any person shall be found in possession of a gun or mechanical device of any description possessing the power to propel with force a leaden or metal bullet or pellet, either in the fields, in the forest or on the waters of this Commonwealth, shall be considered prima-facie evidence that such person is hunting, and shall render him liable to display his "Resident Hunters' License" upon demand made by any officer of this Commonwealth whose duty it is to protect the game and wild birds of the Commonwealth, or upon demand made by any owner of lands or the bona-fide lessee of lands within this Commonwealth, or upon demand made by any employe or representative of the before-named owner or lessee upon whose lands such person may be found hunting, and for failure to comply with such request, such person so neglecting or refusing to display his "Resident Hunters' License" shall, upon conviction, be liable to a penalty of twenty dollars; and the fact that any person may be found upon the highways of the Commonwealth in possession of a gun and the dead body of any bird or animal classed as "wild" in this Commonwealth, shall be considered prima-facie evidence that such person is hunting, and such person shall, upon demand made by any officer of the Commonwealth whose duty it is to protect the wild birds or game of the State, be required to display his "Resident Hunters' License," and for refusing to do so shall, upon conviction, be liable to a penalty of twenty dollars; Provided, That all penalties collected for violation of any of the provisions of this section shall belong to the Commonwealth.

The CHAIRMAN: You have heard the reading of this resolution, what is your pleasure?

MR. DeWITT: I move it be adopted as read.

This motion was properly seconded and duly carried in the regular way, with one dissenting vote, that of Mr. Hutchison, who desired that it be so recorded.

Col. Woodward read the second resolution as follows:

NEW FERTILIZER LAW

Be it resolved, By the State Board of Agriculture, in session at Harrisburg, Pennsylvania, this 25th day of January, 1912, as follows:

That we earnestly recommend to our next Legislature such legislation as will give the purchaser of commercial fertilizers positive knowledge of the source or sources of the nitrogen, phosphoric acid and potash contained in said fertilizer, by requiring the manufacturers to make specific statements of such source or sources on each package placed on the market.

Resolved further, That refusal to comply with the statute after enactment or labeling a package fraudulently should be made punishable upon conviction by suitable fine and disbarment of any brand so marked, or any other brand of same plant food content by such convicted company, from sale in this Commonwealth.

I move you as Chairman, that this be adopted.

This motion was properly seconded.

MR. HUTCHISON: Three years ago, we had a similar bill before the Legislature, and the manufacturers of fertilizers from all over the country attacked the bill and made a strenuous fight against being required to state the sources of their supply of nitrogen and phosphoric acid, and they defeated the bill. It means a good square fight, if you want to bring this before the Legislature again, and if you want to endorse this resolution, you can use all your influence with the members of the Legislature.

The SECRETARY: I was not present at the time this bill was up, but I kept in touch with it. I understand the argument they put up was, that it was almost impossible to tell where they obtained it even if they felt so inclined.

MR. HUTCHISON: They contended that it would compel them to have two sets of fertilizer sacks, and that was what convinced the Committee in the Senate. It is worth while to try again, though, and if it is your pleasure, we will use our best efforts to carry out your instructions. We made a strong and hard fight the last time, and we are willing to try it again.

MR. SHOEMAKER: What would be the penalty provided for violation?

MR. HUTCHISON: In the bill as it stands a fine of from twenty-five to one hundred dollars for the first offence, and two hundred dollars for the second. This calls for the disbarment from the State. We prosecuted quite a number of cases this year and in all of them we were successful.

MR. FENSTERMAKER: If I am correctly informed, there are states that have exactly the information that we want. Cannot the Secretary get this information that we need? If it can be done in other states, why can't it be done in Pennsylvania?

MR. HUTCHISON: We have prosecuted and have convicted them in every case.

MR. FENSTERMAKER: I mean the new law, as outlined to us. I have heard the states mentioned, but have forgotten them.

The SECRETARY: Mr. Fenstermaker is right, and if this argument is brought up again, we will see what can be done with them in other states.

COL. WOODWARD: There are farmers who are compelled to pay high prices for cheap fertilizer. We ought to protect our farmers in this matter.

At this point the Chairman called for the vote and the result showed the unanimous adoption of the resolution.

Col. Woodward read resolution number three, as follows:

CHESTNUT TREE BLIGHT

Whereas, A destructive fungous disease known as the "chestnut tree blight" has appeared in many counties of Pennsylvania, causing a serious loss to timber owners and taxpayers; and

Whereas, The blight threatens the entire destruction of this valuable native species of tree in Pennsylvania and adjoining States, if not checked and eradicated.

Therefore, be it resolved, That the Pennsylvania State Board of Agriculture hereby pledge its earnest and active co-operation with the Pennsylvania Chestnut Tree Blight Commission in the efforts of that Commission to control and eradicate this new enemy of our forests, recommending that each member of this Board assist as far as practicable in promoting public interest in the subject, that the work of the Commission may be advanced as rapidly as possible throughout the affected areas of the Commonwealth.

Be it further resolved, That the bill introduced into Congress, appropriating $80,000 for the use of the U. S. Department of Agriculture in similar work in the various states where the chestnut tree bark disease has appeared, is recognized as a worthy and deserving measure, and the Pennsylvania delegation in Congress is respectfully urged to give it their united support.

As Chairman of this Committee, I move the adoption of this resolution.

This motion was properly seconded and duly carried in the regular way.

The SECRETARY: I move the adoption of the report as a whole.

This motion was properly seconded and duly carried in the regular way.

The SECRETARY: Now, Mr. Chairman, it is understood that this Committee is to remain as a Standing Committee on Resolutions, and make their report at the next meeting.

MR. SNAVELY: That is the sense of the Executive Committee.

COL. WOODWARD: I'm asking for information. Is this Comtee expected to devise resolutions or simply to consider them, as they did this afternoon?

The SECRETARY: My own thought is that they are to perform the duties performed by Committees on Resolutions generally; they are a deliberate body and they can devise resolutions, and also consider those offered by others.

COL. WOODWARD: What do I understand the Secretary to mean by the "next meeting?"

The SECRETARY: By the "next meeting," I mean the next Annual Meeting.

MR. HUTCHISON: I learn with a great feeling of sorrow this afternoon. that a call has come from the State of Kansas for the services of Prof. Cochel. He is doing a great work in Pennsylvania along the line of developing the beef cattle industry, and I think it would be in order for our Board to pass a Resolution commending his work, and trying to keep him here.

Now that he is developing an interest in the livestock industry, it would be a serious loss to the farmers of Pennsylvania to have him go away. It takes a man some time to get into touch with it. He has gone up and down the State and has made the acquaintance of our farmers, and received their confidence, and I would, therefore suggest that we take some action in the matter.

MR. MARTIN: Mr. Chairman, if I have the privilege of the floor, I would say that the livestock industry of Pennsylvania would meet with a loss that could not, in many years, be repaired, in the taking away of Prof. Cochel, and I would suggest that this meeting offer a vote of thanks to Prof. Cochel for the good work he is doing, the influence of which will be felt for at least a decade to come.

COL. WOODWARD: Gentlemen, I am ready to accept the motion of Mr. Hutchison, and also to second that of Mr. Martin.

This motion was duly carried in the regular way.

PROF. COCHEL: Mr. Chairman, I suppose I should remain entirely in the background, but after such a vote of approval I want to express my appreciation of your acknowledgment of my work in Pennsylvania. It may be that conditions are such in Kansas that I will be glad to stay here, but there it one thing I want to say and that is, that unless the support of the College is much better than it has been in the past, it would hardly pay a fellow to stay there. We are treated with the utmost courtesy, but we are working under a handicap, and it is simply a question of opportunity.

I thank you very much for your appreciation.

The CHAIRMAN: Now, if there is nothing else, I will just call your attention to the fact that there is a good program for this evening. We will have the reports of Dr. Harvey, and some of the others.

If there is nothing further, a motion to adjourn will be in order.

COL. WOODWARD: I move that the Secretary of the Board be requested to submit a copy of Mr. Hutchison's resolution to the next Legislature when it meets.

MR. HUTCHISON: I think it would be well for the Secretary to communicate with the Trustees of the College, and also with the Faculty in the matter.

COL. WOODWARD: I withdraw my resolution.

The SECRETARY: The Secretary will be very glad to have a copy of the resolution sent to the various communities, and also to the next Legislature.

MR. FENSTERMAKER: I see no reason for withdrawing it, if we pass it, it may do some good.

COL. WOODWARD: The resolution commending Prof. Cochel has been passed; I withdraw my resolution, because it would emphasize the statement of Mr. Cochel in reference to the support of the College.

MR. STOUT: The boxes containing the different varieties of soil specimens, will be left here between the sessions this afternoon. If any of the gentlemen wish to see them, you can probably do so better by day than after dark. They will probably be taken away after this meeting.

MR. JOEL A. HERR: I move we adjourn until 7.30 this evening.

This motion was properly seconded and duly carried in the regular way.

Adjourned until 7.30 P. M.

Harrisburg, Pa., January 25, 1912. 7.30 P. M.

Mr. Seamans in the Chair.

The CHAIRMAN: The meeting will please come to order. The first number on the program is the report of the Economic Geologist, by Dr. Isaac A. Harvey, of Lock Haven, Pa.

Dr. Harvey's report was as follows:

REPORT OF THE ECONOMIC GEOLOGIST

By DR. ISAAC A. HARVEY

In 1906, having noted in the newspapers some discussion and controversy relative to the coal supply in the United States, I shortly wrote to the Philadelphia Press an estimate of the entire amount of coal in the several states of the Union, based on the latest reports of the National Geological Survey, and such additional data as I had acquired from other sources.

The estimate of the entire area of coal in the United States as published prior to 1906 was 270,000 square miles, and I ventured to increase the same to 450,000 or 500,000 square miles by adding a reasonable per cent. to the figures in the several states and territories, so that my final figures of the amount of coal were about three trillion tons, which at the persent rate of production and consumption and with allowances for a certain increase in demand, proportionate to the years past, would last as long as the world has been in existence according to the Mosaic records.

Some time last year, Mr. Carpenter, the noted reporter and correspondent of the Philadelphia Press interviewed Prof. Smith, now Director of the United States Survey, and derived from him a computation or general view of the coal in the United States and similar to my own figures as sent to the Press. His calculation was the same in substance as mine and intimated that the body of coal in the United States might last as long as the world has stood. I admit that such a computation seems fabulous and unreal, but as the several coal seams in forty or more of our counties in this State, if laid flat as one workable seam, would more than cover the entire State; so, also the various coal areas in the United States, if arranged in the same position and as one good workable seam of four feet or more in thickness, would very much more than cover or equal the area of the entire nation and all its dependencies.

Going to Arizona and Senora, Mexico, in 1889, for Mr. Dodge, of New York, I made some examinations for copper and coal and with the data so obtained venture the prediction, that, within a generation, Arizona would exceed Michigan in its product of copper, being mostly found in low grade ores and yielding variously from five to ten per cent. of this metal. This result has been realized as the records show. Prior to this trip, the coal in Arizona was considered an unknown quantity and no figures had ever been given by the United States Survey, the several efforts at local development on the Apache Reservation, and incidentally elsewhere, failing to afford any encouragement of workable deposits or any satisfactory guarantee that Arizona would ever show any available basins for coal operations or production that would justify development or mining.

I saw enough of the deposits in Arizona and Senora to persuade me to believe, or at least hope, that Arizona would ultimately yield her proportion of the carboniferous products in the shape and quality of good coal of several kinds to place her in the list of the coal producing states. Within the last three years, or about eighteen years after my hurried exploration down there, the assistants of the United States Survey secured some accurate information and reliable figures, whereupon they have announced, with the approval of the Director, that Arizona contains as much available coal as the entire amount thus far mined and used in the whole country, and, of course, this means many billion tons.

Thus, while the actual epochs or periods in which coal may "exist" have been ascertained to a certainty and geologists have proved the limit of the rocks that contain coal, yet the defective estimates of acreage and extent is due to the superficial and hurried manner in which the coal fields are in the first instance examined; and, thereby, the actual extent of the coal bearing rocks not demonstrated or determined in a given field, locality or state; and, as a result, the maps and reports very much circumscribe the coal basins, and exclude from the estimates and surveys much of their area that otherwise and by careful investigation would be contained in the figures that report the same.

In after years, a revision of these reports and a more careful and thorough development show a very marked increase from the original figures and estimates, both of quantity and area. This applies to every state that contains coal, and in which the tendency to submit a conservative report has so often warped the judgment and furnished a minimum computation with reference thereto.

Thus, in my report to you two years ago, I estimated from ninety to one hundred billion tons of coal in this State; so that my prior figures in a venture to estimate the amount in the United States assumed that our State contains about one-thirty-fifth of the entire quantity of coal in the United States. The length of time that this amount would supply the people, (varying figures having been suggested by prominent geologists,) depends, of course, upon the increasing demand, the economical and careful mining, with the probable discovery of devices or methods whereby the coal waste will be reduced to a minimum, its by-products utilized and the entire body of heat produced be controlled and husbanded with the least possible loss.

Again, what skill and invention may do to accomplish some of the needs now depending on coal and thereby reducing the demand, or at least restraining the demand, no one can conjecture; and that it may be many centuries, perhaps some thousands of years may elapse, before the Nation shall experience a coal famine; and what may be provided as a part substitute for coal ere such a calamity may ensue, no one can venture to surmise, "for the thoughts of men are widenend with the process of the suns." Genius is limitless in its conceptions and possibilities towards contrivance and invention. Another feature of the utility of coal and its value to the consumer is that while analysis will determine exactly its elements and its amount of combustible matter, yet its chemical composition does not always indicate the real or comparative fuel efficiency which ofttimes seems more valuable by reason of its structure than its chemical composition. Thus the product of a certain coal seam may contain fuel matter (condensed carbon and volatile matters) to the amount of 90 or 95 per cent. and comparatively very pure but so soft and friable that it crumbles or disintegrates very readily and its use is very much reduced by waste through the grate bars under the boilers of locomotives or stationary engines; and instead of complete combustion and reduction to ashes, a very considerable per ecnt. is never consumed, thus impairing its fuel efficiency when compared with other coal which may show the same analysis, but being compact, hard, and as some call it,—lumpy, will have a decided advantage over the softer coal in the production of steam or even for domestic use.

So, also, I have seen along certain railroads immense quantities of coal half consumed and mixed with imperfect coke, the product of the locomotive fires and dumped from the ash pan; so that people living along the line find it convenient to use these ashes for fuel in their households. I have stated these facts many times to the superintendents of railroads, and also in my reports on coal properties. I know instances where coal from a certain seam, notably the A., and containing 85 to 88 per cent. of fuel, rendered better service by actual test and use than certain other coal that analyzed 92 or 93 per cent. of fuel matter; the difference in efficiency being due to the compact and solid structure of the inferior coal, chemically, when compared with fragile, friable and crumbling structure of the other.

Hence, do not conclude that the coal that shows a lower per cent. of fuel matter is serviceably less valuable or efficient than coal containing the higher per cent. of fuel matter, unless both are of similar structure. It is the units of heat that are required and the actual production of steam that will determine the value of the coal to the consumer. Bear this in mind, and while having due regard for analyses and chemical purity, also consider the structure, and friable also, that the harder coal, upon the bituminous basis having an equal amount of fuel with the softer coal, will be found invariably to be of more utility.

It is a subject of much concern how we shall be able to supply the increasing demand for iron ore, not only in this State, but elsewhere. Much of the ores now used in Pennsylvania are imported from other states, from Cuba and elsewhere on this continent and consist largely of red hematite or steel ore, so called, from Michigan, Wisconsin and along Lake Superior; the product of metallic iron, being almost invariably 65 to 68 per cent. and in some exceptional instance 70 per cent. In our State and elsewhere are some important deposits of magnetic ore, magnetite and sometimes nearly or quite as high in metal; but often yielding as low as 35 to 40 per cent. The red hematites having singular value by reason of their being readily converted into steel without the basic process; that is lining the converter with an alkali preparation,—and hence producing the steel at considerable less cost. With the exhaustion of steel ore, red hematite and, in fact, the magnetic ores, we will have remaining certain veins or deposits of brown hematite associated with our lime stones, and, notably, the lower silurian rocks, with incidentally, the same ores in the Clinton shales, Catskill, etc., and the gray carbonate ores of the coal measures and sub-carboniferous rocks producing from 20 to 50 or 55 per cent. of metallic iron. These are sometimes used in the production of pig metal, and, especially, where convenient for mining and transportation, but are not deemed valuable in comparison with the richer steel ores, magnetites, etc., that are imported as described.

Again, there are extensive deposits of red shale with their associated rocks that contain from 15 to 25 per cent. metallic iron, and an urgent question is today, or will be ere many years will elapse, how shall we utilize these low grade rocks, and by what process make them valuable for iron and steel products with reasonable cost? There are chemists experimenting towards a solution of this question, and I have seen some favorable and encouraging, if not complete, deductions in this direction; in one instance, a Southern gentleman having demonstrated to a Wall Street Company, engaged somewhat in promoting such various devices and inventions, that it is possible to reduce such low grade or lean ores by a chemical or electro chemical process, whereby the ores containing as low as 6 or 8 per cent. of metal, can certainly be made useful and at a nominal cost, so far as the process is concerned. Whether these samples, as shown to me, were typical of the results of the process if applied to a large amount of ore, I cannot say, but the results seemed promising to me and others who examined them. This threatened iron ore depletion or exhaustion naturally evokes the question, who will in a sensible and reasonable measure find a substitute for the rapid exhaustion of iron ore; and aluminum has been suggested by virtue of its lightness, toughness and flexibility; so that if its production may be realized at a reasonable cost, the disappearance of iron ore will not create the dismay that is now so ominous, and the process is yet to be discovered whereby the almost limitless clay deposits, with their 15 to 25 per cent. of alumina (oxide of aluminum) may respond to the query as to what will replace iron, and how meet the demand, for iron products or something that will be quite as useful and available, without hardship, when iron ores of the better grade have disappeared.

Again, we must resort finally to chemistry or electricity or both, and who shall put a period to the word electricity, in contemplation of its innumerable devices and the domain that it affords for the exerting of man's skill and almost supernal conceptions and ingenuity. The seemingly impossible solution of many problems of perplexing effort and unusual exertion will be found year after year in the application of electricity or electro chemistry and its wondrous and almost divine devices, phases and potency. While delivering a former report to this honorable body, I referred in a digressive way to the problem of good roads and very briefly suggested a line of experiment that might contribute to the solution of this momentous subject.

Nature has given us pertinent lessons whereby we may clearly experiment and duly acquire some definite ideas towards the making of roads that will not so shortly vanish away in dust along the country thoroughfares, lanes and by-ways, cared for in part by the old time supervisor. We notice the exposures of slate and shale, red, black and gray, containing from eight or ten to twenty-five or even thirty per cent. of alumina which is the binding or cementing ingredient of all clays used for the making of fire brick and building brick and other clay products, and we often see the roads as smooth and compact as any that can be constructed with limestone and sandstone and less liable to become disfigured if I may use the term, and unsightly by the impact of wagons, autos, etc., which so soon wear out and destroy artificial roads. Is there not a combination of silica, alumina and lime contained in sandstone, limestone and shale, in proper proportion, that will produce a solid and compact road bed, more permanent and lasting, and yet more acceptable to the traveling public, than any road made simply with sandstone and limestone without the aluminum? I think so. In a tentative way, why not test these elements by repeated experiments, using say, from one-third to one-half of clay or clay shale containing, as it does, from fifteen to thirty per cent. of alumina and from fifty to seventy of silica, with a small ingredient added thereto of limestone, and changing the proportions of these several elements time and again, and applying to certain "stretches" of road until the best results are obtained. I mean to say, briefly, that this element of alumina, as found in clay, or shale added to the application of limestone and sandstone or sandstone alone, is rational in theory. Alumina in proper per cent. will make an admirable addition to the road bed, avert very appreciably the wearing away of the road and prevent measurably the dust arising from sandstone and limestone roads. Give this your consideration and notice what nature has suggested.

Aluminum makes the road smooth and level and if not so hard and compact as limestone and sandstone, yet being somewhat flexible or slightly plastic is certainly more to be desired as a component with limestone or sandstone or both than the two latter elements could be without aluminum. In short, shale and slate make a better road than limestone and sandstone, by reason of the presence of a certain per cent. of aluminum which has been almost disregarded in road making. A bastard limestone, which is a native cement rock, would be better adapted to the construction of roads than a pure limestone would be, since it contains a small per cent. of alumina.

Three years ago, I made a few remarks relative to the game and fish laws, with a special reference to deer and trout, and upon the request and insistence of scores of men representing hundreds or thousands of others who enjoy fishing and hunting, I am constrained to make some further comments on the subject.

The almost universal opinion among trout fishers, with very rare exceptions, is that the number of trout that may be caught should be prescribed by law, and not the length thereof, and no one with experience in fishing the trout streams, can deny that three-fourths or more of the small trout, being less than six inches, die after being caught and thrown back into the stream, and thus the streams are largly depleted of the same. I am sure that instances have become very frequent where the fisher has actually hooked two hundred or three hundred small trout before getting what is termed the limit of fifty trout, as allowed by the statute. I tried a stream several years ago and caught nine trout of less than six inches in length, and throwing them back, noticed that most of them turned on their sides and probably died. The acceptance of the opinions of thousands of men who know these facts by experience would be wise and expedient in framing these laws. In our county (Clinton), 161 bucks were killed last season and the number of hunters was six or seven hundred, estimated, or a hunter for every thousand acres of the area of the county. In 1910, the number killed was 140, and the excess of last year's sport due, not to the fact that there were more bucks in the county, but to the tracking snow that continued almost through the entire fifteen days of the season; and the season of 1910 was not so favored, and had the smaller number of deer slain. I have talked with scores of hunters, probably with hundreds, and know the trend of opinion of all classes of men who seek sport of this kind in the woods, and nineteen out of twenty are positive in the opinion that the most wise, just and effective law would provide for the killing of one deer by each hunter, regardless of the sex thereof, leaving the hunter to secure either a buck or doe as the opportunity afforded. This view I have derived from hundreds of men and ranging from twenty to seventy-five or eighty years of age. Moreover, it does not seem to them that the section that requires a hunter to see the horns before shooting at a deer is in any sense, or leastwise only in a limited way, a protection to the life of those who are in the woods in the hunting season, but that the many sad accidents were formerly due to carelessness and to the excitable state of mind of certain persons who lack self-control and nerve; and that later the hunters have learned to be more upon their guard and self-restraint and wear caps or clothing that will at once distinguish them from deer or other animals. Sad experience has taught more care and forethought, so that accidents or shooting into the bush at some indefinable object are almost certainly averted, simply by the schooling that has been experienced. Any man that would shoot an indistinct object in the bush upon a nervous impulse would not be so deliberate in any emergency, as to look first whether it has horns or not, and such persons should be barred from hunting under any and all circumstances. Three years ago I noticed some bear tracks in the snow in a remote part of West Keating township, in my own county, and as a bear had been shot a few days before, within a short distance of these tracks, by hunters to whom I showed his "signs," in the snow and near a spring, I got a Winchester from one of my men, then prospecting in that locality, and standing in a small natural clearing where many tracks appeared, I noticed, just beyond, the brush shaken by some object moving therein, and with a slight nervous tremor, but a self imposed injunction to "hold on quaker" and be cool, I waited for the object to appear in the clearing with a determination to kill a bear; but, very soon one of my men with dinner pail in hand and returning to camp half an hour early emerged from the brush. I didn't shoot but severely rebuked him for not being a bear. Now, what would have been the result if I had fired into the oak brush two or three times? Probably, I would have killed a man for whom I had a very kindly friendship. Moreover, the theory that the present law is effective towards the preservation and increase or propagation of deer is erroneous as avowed by all the hunters, with one or two exceptions, with whom I have conversed on this subject; inasmuch as all claim and affirm most positively, that there are very few fawns now in the woods and very many barren does, which as they say is due to the destruction of the bucks; further, that each buck has its mate for a period of many months and rarely seeks other does; and ordinarily, will not go any very great distance to consort with other does after it has found a mate. I have noticed many deer tracks in the snow in hunting sections after the season closes and through December, January and February, and there was a most woeful absence o fbuck tracks, which are readily distinguished from the doe tracks.

Now, the question has arisen, what limit there will be to the killing of bucks and will the time arrive when these animals will be entirely exterminated, barren does in numbers probably left to die of old age, or be killed by the wanton hunter; and finally, all tracks and traces of deer become obliterated. I cannot conceive that the well spun theory, intelligently formulated and the laws therefrom enacted can avail with the same desired results for the promulgation of deer and the prolonging of the hunters enjoyment, as any law or section thereof based upon the actual experience and concensus of men of all classes and grade of intelligence and many nearly of the same or equal stamina or discretion with the members of the assembly who frame the laws in this respect. Is it not true, that the country members supposedly informed upon this subject, do not participate in the preparation of these laws upon the idea of equality with the city members, who to the number of forty, fifty or sixty, very largely control the legislation in this and other directions, in a sense, excluding the knowledge, wisdom and experience of the country members who may only have been in the Assembly, at most, a term or two. An old hunter remarked that "these hunting and fishing laws are made by men down at Harrisburg who don't understand the human nature of the deer and trout, as well as us fellows that live in or near the woods." Kindly bear in mind, that I have no strictures or criticism for the Game and Fish Commission, or upon its worthy and efficient Secretary, Dr. Kalbfus, since they and he are effectively enforcing the laws; but being compelled and urged by so many men whom I know to be wise in these things, I could not refuse to refer to the matter, and have been many times assured that the brief suggestions in my former report were read and widely approved by the men who enjoy hunting and fishing and are anxious for a continuance of these sports.

A majority of the counties represented in this meeting contain wide areas of forest and woodland where trout and deer and other game should abound and afford good sport, but from the thousands of acres of nearly primitive woodland in some of these counties both trout and deer have nearly or entirely disappeared.

The CHAIRMAN: You have heard the reading of this very able paper; what is your pleasure?

The SECRETARY: I move it be received and printed in the journal of the proceedings.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: Next in order is the Report of the Agricultural Geologist, by W. H. Stout, of Pinegrove.

Mr. Stout's report is as follows:

AGRICULTURAL GEOLOGY

By W. H. STOUT, *Agricultural Geologist*

SOIL

Soil is defined as the upper stratum of the earth, the mold or that compound substance which furnishes nutriment to plants, or which is particularly adapted to support and nourish them.

There is much concern of late regarding our natural resources and their preservation. Forests, streams and minerals appear to be considered the most valuable from a business point of view, and while all are essential to civilization as necessities, they are only secondary in importance to the human race.

The soil is our most precious inheritance, deserving more care and consideration than is commonly bestowed upon it. It has taken ages of time and ceaseless work of natural forces, physical and chemical, to create the first few feet of arable soil, that is of any value in the art of Agriculture. It is comparatively only a short time since the country was settled by the white race, yet soil depletion to the point of exhaustion is evident where the early settlers first located.

Waste and destruction follow in the wake of civilization. Before the advent of the Europeans, the demand upon soil resources was limited. The tribes then in possession lived a primitive life upon natural resources of game, fish, fruit and vegetables, with a little corn and beans cultivated, along with some tobacco, in a limited way in some localities.

There are periods in the history of every country when agriculture becomes more urgent, and this country has arrived at, or is approaching a time when the supply of food products will not be sufficient to maintain an increasing population.

This is, however, not a matter of immediate concern but the admonition is timely, with the knowledge that poverty, ignorance and superstition follow the decline of prosperity, which is ever measured by the abundance of soil products, and such products are contingent upon the fertility and texture of the soil.

Some of the one-time most productive and wealthy countries known in history, where art, science, education and religion had their birth-places, have lost their identity and are divided among and are under the dominion of German, British, French and American rule. China is the only extensive territory that has maintained its independent existence for a long period. There is, however, much poverty and suffering in that empire, where thousands of the inhabitants are starving at times, and the revolution now in progress is attributed to the suffering of the laboring class.

The Chinese have lived a long time upon the products of the country, consuming at home what was produced, and caring religiously for all wastes and fertilizers available. Subsisting upon a plain and meagre diet that does not appeal to Europeans, the Chinese cultivate their land in small tracts with hand tools, and live or exist with great economy. They have not depleted their soils by exporting grain and other products that contain fertilizing elements that impoverish the land, and as a result they were able to maintain an existence as a nation longer than any other.

It appears that since the world civilizers have gained a foothold in the ancient empire, their troubles have increased and multiplied in proportion as modern methods of business, transportation, education and civilization has progressed. (Under the convincing power of gold, thirteen-inch Mausers and gatling guns, and the benign influence of promoters from New York, London, Paris and Berlin have succeeded in converting the heathens to worship the Golden Calf, adopt civilized costumes and cut off their hair).

The primitive methods, the scrupulous care and economy necessary to maintain a bare existence does not appeal to our race, and that the poor of this country may be forced to adopt in the future similar methods is not a pleasant prospect to anticipate. Instead of preserving their fertility at home like the Chinese, the farmers of this country as soon as land could be made available to produce crops for export, commenced sending them abroad in increasing quantities, often without any profit and often at a positive loss. We take pride and boast of great wealth in our rich lands and the ability to supply other countries with all sorts of farm products. It did not occur to our people that every bushel of grain, every pound of meat, cheese and other products carry away fertility that is absolutely lost to our soil.

From the statistics we learn that during fifty-five years to 1910, the farmers produced twenty-two billion bushels of wheat, of which five and a half billion were exported as grain and flour. Calculating the fertility loss at four cents a bushel, it amounts to two hundred and ten million dollars. The remainder of the twenty-two billion bushels (four times as much as was exported) was consumed in the country and also lost, except what was fed to stock. Thus we lost upwards of eight hundred million dollars in fertility on the wheat crop alone, and much more adding other grains, animal products, cotton, etc., makes a sum almost startling in the amount.

We are robbing posterity of their share of Nature's provisions for existence, in exhausting the soil fertility accumulated during ages since the Tertiary period and the beginning of the Quaternary, when the climate became favorable for the support of vegetable and animal life.

Notwithstanding the industry of American farmers in robbing the soil to produce crops for use and export from this country, according to an expert in international finance, our debt to foreign countries is $6,575,000,000. We exchange for our soil products the essentials for existence, the products of other climes, that add nothing to our resources excepting the potash and nitrate imported. We import silk, wool, coffee, cocoa, wines, hemp, flax, hops, molasses, sugar, dates, figs, raisins, oranges, olive oil, camphor, rubber, jewels, diamonds and various other articles for the millions in value of our soil resources. This generation seems dissatisfied with the waste and destruction wrought by its inhabitants but invite all nations to our feast of abundance to aid in its more rapid exhaustion.

These are conditions facing this country, just being realized by thoughtful persons, and how to increase crops at reduced cost is the serious consideration of consumers. This is the one industry that is urged and encouraged to produce excessive supplies regardless of cost or the price. Other industries are not operated on this plan.

Returning to the text the "Soil," there is much to consider. Soil making is in constant progress. Rain, heat and frost acts as disintegrating forces liberating particles from the solid rocks, which form the basis for soils of various degrees of texture according to the nature of the rock from which the material is derived. There are various chemical elements in the rock formations, some of which are essential to plant life to a small extent like lime, iron, magnesia, potash, soda, phosphoric acid and nitrogen, in addition to silica the most abundant of soil constituents.

There is probably no state having a greater variety of soils than the old Keystone, and certainly no better farmers. The folding of the rocks east of Allegheny mountains brings to view thirteen geological divisions and many strata. The Delaware, Lehigh, Schuylkill, Susquehanna and minor water courses cut squarely across the anthracite coal basin, with the Pottsville Conglomerate, Mauch Chunk Red, Pocono Sandstone, Catskill, Chemung, and others of the Devonian System, followed by the Silurian, New Red sandstone, granite and traps.

There is little uniformity of soil until the Silurian south of the Blue mountain is reached, where the Hudson River, Utica shale and limestone valleys spread over considerable areas. The New Red, the latest formation, extends over various counties mixed with the traps from Reading to Philadelphia. Some sections in Northampton, Monroe, Carbon, Luzerne, Columbia, Montour, Northumberland and Lycoming are partly covered with glacial drift and the edge of the Moraine, with is boulders, sand and clay of various degrees of agricultural value.

In the glaciated district, the old lake bottoms and swamps are very fertile where drainage can be effected and on the elevations the soil is generally productive, excelling all others for fine fruit of best quality, Spy, Baldwin, King and Greening apples grow to perfection, and other fruits are successfully produced. The great potato districts in Maine, New York, Michigan and Wisconsin are on drift soil, an ideal condition of soil and climate for potatoes.

Northwest and west, the same conditions exist in Tioga, Potter, Warren, Crawford, Venango, Butler, Lawrence and Beaver counties where the soil is more uniform, resting on horizontal rocks of the bituminous coal, with the mountain limestone.

The anthracite coal field contains no soil of value excepting where the Mauch Chunk red appears in valleys, like the Conyngham, Catawissa, Lykens and Quakake. The various red soils, Mauch Chunk, Catskill, Clinton and Mesozoic or New Red produce fair to very good soil according to depth and texture.

The Devonian and part of the Silurian systems between the first (Blue) and second mountain has some narrow strips of good soil, but is quite various on account of the many strata standing on edge coming to the surface composed largely of shale. The soil on hills is commonly shallow and leachy while the bottoms consist of a cold wet clay soil derived from the clay shale deposited on an impervious rock bed. In some counties, the Lower Helderberg limestone forms good soil of considerable extent, and is useful on the shale and clays, especially so on clay bottoms on account of its mechanical effect in granulating the finely divided particles.

Besides the use of lime to change clay soil to make it more friable, lime may have a chemical effect, to free potash and phosphoric acid from soil combinations and correct acidity. Sand and clay are the principal constituents of all soils and, if in proper proportion, give it texture, and when vegetable material is mixed with it forms mold.

Mixing soils is quite practical, but with present conditions also unprofitable, considering the value of good lands. An acre of soil to a depth of nine inches weighs about two thousand tons, so it would be necessary to move a thousand tons to spread four and a half inches of either clay or sand for mixing. At a very low calculation of twenty-five cents a ton for handling it would cost $250.00 to prepare an acre which is more than the average value of good Pennsylvania soil.

The soil samples presented here are only a few of the many existing over much of the State. All soils are derived from two sources; Igneous or Volcanic and Aqueous, deposited by water. From these are derived the great variety, changed by the every active elements: wind, rain, snow, heat and cold.

The igneous being the first formed rocks over the surface of the earth, all the others are necessarily derived from that source, through disintegration and transportation by water, ice, gravity and volcanic activity. All elements from which soils are formed were once a general mass of unorganized material.

The various minerals are all derived from the oceans, excepting coal and graphite which obtained their carbon from the atmosphere. The substances useful in agriculture, aside from the rocks, are deposits like salt, potash, phosphates and lime which accumulated from previous existing forms, and held in solution in water.

The Dead Seea and Great Salt Lakes are examples of the condensation going on and the salt mines and brines from which salt is condensed are evidences of rock formations having been deposited at later periods, which covered the saline deposits. The other elements useful in agriculture are derived from the same sources.

All soils contain certain fixed substances in varying proportions and are fertile so long as certain elementary substances exist in a soluble form. Whenever the time arrives through continued cropping that a soil is depleted of the soluble elements accumulated during past periods regardless of its origin, it will no longer produce remunerative crops.

Its restoration and maintenance then becomes a problem of economics of vast importance. Some soils like those of igneous and organic origin, possess inherent substances in larger quantity and a more soluble form than most of the sedimentary of clay and sand

Numerous chemical analyses of soil from various sections prove that the same formation differ widely. The igneous granites and traps from Bucks, Montgomery, Lehigh and Philadelphia counties have a large per cent. of potash and soda varying from four (4) to thirteen (13) per cent. Lime, magnesia, iron, silica acid, alumina is contained in various proportions. A sample Mesozoic (New Red) from Bucks county contained three per cent. potash, a little lime, two and a quarter per cent. iron, seven and a quarter per cent. alumina, a small quantity of phosphoric acid, eighty-four per cent. silica.

The restoration of exhausted soils to a productive condition is expensive. Notwithstanding the abundance of the plant elements found by analysis in soils, crops can not be successfully produced without given quantities of soluble materials.

Chemistry is of invaluable service in many lines of human endeavor including agriculture. The farmer has, however, a wider field for experiment than the chemist in his laboratory confined to a limited space with his acids and crucibles. The farmer has for his domain the mountains, hills and valleys, proclaiming in unmistakable language the fertility or sterility of the soil. Poverty grass and cinque-foil, huckleberry and hogberry, scrub oaks and alders, laurel and fern, rock oak and red oak, Giant Sequois and cedars, pine and hemlock, walnut and chestnut, hickory and sycamore, beech, birch, and maple with the many grasses and plants indigenous to the surroundings, constitute in Nature a laboratory more delicate and more refined than the most elaborate equipment in the hand of science.

Supplied with a tract of ground, some seeds and plants, patience and industry, fertilizers of various kinds, the practical farmer can solve the problems of fertility and crop production better than any one else. Plants like animals require a balanced ration; the one nitrogen, phosphoric acid and potash; the other protein, carbohydrates and fats. The business of the farmer is to take the crude material, and through his chemical laboratory on the land change it into the refined products useful to mankind. This appears to be a simple process of transmutation; it is surrounded with many difficulties, contingencies and hard labor, that is so irksome to many persons, retarding the back to the land movement.

Practical farmers are not so much interested in scientific research and theories as in the conditions with which they have to do and how to use what they possess to the best advantage to provide for themselves what is required by them and of them. Soil depletion like the shadow of an eclipse moves westward having reached the 100 degrees west longtitude in its progress over the Continent.

We have the assurance that "seedtime and harvest shall not fail," so we may trust to Providence for the future of agriculture; in the meantime preserve the soil and trust to explorers and prospectors to find new stores of potash, nitrogen and phosphoric acid somewhere on the national domain.

While the Government is engaged in preserving natural resources, one of the most valuable elements is wasted; nitrogen in explosives, by firing salutes to thirty-cent Potentates, Embassadors, striplings of Royalty and Kings from the Cannibal Islands, etc., costing hundreds of dollars and the game not worth the powder.

BIBLIOGRAPHY

Rocks and Soils—Stockbridge.
Geo. Chemistry—U. S. Geological Survey—Clark.
Agricul. Chemistry—Johnston.
Two Geological Survey—Penna.
U. S. Soil Survey.
Principles of Agriculture—Voorhis.
Academy Nat. Sciences—Theo. D. Rand.
Penna. State College Reports.
King on Soils.
Soil Investigations—University of Illinois.
U. S. Geological Report, 1891, Origin and Nature of Soils, by N. S. Shaler.

The CHAIRMAN: You have listened to the reading of this interesting paper, what is your pleasure?

MR. DeWITT: I move it be received and recorded with the proceedings of the Board.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: The next subject is the Report on Forests and Forestry, by the Commissioner of Forestry, Robert S. Conklin, of Harrisburg, Pa.

MR. WILLIAMS: Mr. Conklin is not present; but if you care to listen, I can make a brief report for him.

The SECRETARY: We shall be glad to hear from Mr. Williams, who is the Deputy Commissioner of Forestry, and familiar with all the details of the work being done in the Department of Forestry.

Mr. Williams spoke as follows:

REPORT OF FORESTS AND FORESTRY

By I. C. WILLIAMS, ESQ., *Deputy Commissioner of Forestry*

The work of the Department of Forestry may be properly divided into three classes: First, conservation; second, protection, and third, the development of forest resources.

During the year just passed we have added to the area of our forest reserves, 32,714 acres, so that the total area of the forest reserves owned by the Commonwealth, on January 1, of this year, was 966,295 acres. There are now under contract to the Department a sufficient number of acres to bring the area up to a round million, provided we are able to purchase them.

This land was all bought and paid for by appropriations made by the Pennsylvania Legislature, beginning about the year 1898, and consequently covering a period of thirteen years; and the average cost of this land to the State on January 1, 1912, was two dollars and twenty-four cents per acre. As land goes in Pennsylvania, this would seem to be an exceptionally low price, and it is a fact that a large proportion of the acreage purchased is really worth a very great deal more today than two dollars and twenty-four cents; in fact, the value of these reserves to the State today stands about six to seven dollars per acre. To show you, let me cite an instance: An area was bought in 1902, and was then well covered with a fine stand of timber, which the owner thought he could not take out with a profit; consequently he let the State have it for two dollars and fifty cents an acre. There were many trees in the tract as it was—hundreds of them—which were worth more per tree than the price paid per acre. Eight years later, in the year 1910, the gentleman who sold this land to the Department, returned and wished to buy it back at a price more than three times what we paid for it, and he would have been mighty glad if he could have repurchased it at triple the price; but there is no authority of law to sell an acre of this land, consequently we could not sell; and for the further reason that these lands are all too valuable to the State to part with, even if the authority did exist.

Now, as to the care the Department is taking of these lands: There is the pruning and planting, and it is the result of this need that there are today upon the forest reserves forty-six State Foresters, who have received a technical and practical education in the school established and maintained for the purpose of educating foresters. With them there is a corps of helpers of about ninety other men who are known as "Forest Rangers," and all give the State a full return in every direction. First in work. These foresters, with their assistants, the rangers, last year completed over a thousand miles of roads and trails in the reserves—a road sufficiently long to cross the State three times from Philadelphia to Pittsburg. There is no use talking about the value of reserves until you have the means of getting into them. It takes money to develop forests, but you might just as well throw your money away, if you do not propose to follow up purchase with a good road system. Roads are necessary in order that everything may be used at the proper time and that these areas may be properly developed so they may return to the State the very largest value per acre, much more than it is possible to get from them without means of proper access.

The law gives the Department the right to lease valuable minerals found on such lands. The minerals so far found are mostly valuable rock. In one of the counties in 1903, a lease was entered into to run twenty years. To date it has run about eight years. This land cost the Commonwealth two dollars and seventy-five cents per acre, and the protective measures since its acquisition have added a few cents more to the investment. The whole tract leased cost something over one thousand dollars. The royalty derived from the lease to date has more than paid for the original cost of the land, plus the protective expense, figuring interest at 2 per cent., which value the Commonwealth receives on its deposits in bank. It has left a very considerable margin after paying all the costs, besides its primary value to the State. In addition, we have some twelve more years for the lease to run. Now, that is but a single instance of the profitable development of a piece of land primarily bought for timber.

The Department of Forestry grows young trees upon these lands. For this purpose it has established three large nurseries, and a number of smaller ones which furnish thousands of seedlings each year. These nurseries cover about forty acres. One is located at Mont Alto, Franklin county, one at Greenwood in Huntingdon county, and one at Asaph in Tioga county. Last year the planting of trees in the forest reserves equaled nearly two million young trees. Wherever there is a bare space it is the purpose of the Department to plant it with young trees and protect them in order that they may grow into future good timber. Pennsylvania started out with this point in mind, that forestry is a great economic problem, and involves the economic principle of producing the greatest possible return in the least possible time.

The new School Code, passed last year, provides that the net returns of these forest tracts shall be applied to the public schools of the State. It is not likely that the schools will receive much return in the near future, because most of the land is stripped. The State acquires land only after the lumbermen have stripped it of everything they can remove, and then starts in to re-establish the forest. It is only after the forests have been restored and have become capable of making a return, that a large net profit will be derived. This will take a long time, because it is not possible to grow woods over night.

To show that the work of the State has some magnitude, last year about a thousand pounds of seed of Coniferous trees (mainly pine) were planted, and about three thousand pounds of broad-leaved tree seeds like the oaks and maples. In all, four thousand pounds of seed in one year put into the ground for raising young trees. This is only a beginning, and the future, I think, will show this work doubled and trebled, unless it is so we will not be able to plant these areas in the short period in which they should be covered.

We still have an old problem with us—a problem that has been such since the days when William Penn first entered the woods,—and that is forest fire. It was formerly thought that fires were a necessity, that dead leaves and dead wood might be destroyed, and this idea was not peculiar to Pennsylvania. The effort of the Department of Forestry has been to teach the people that fires are not necessary: in fact that they are unnecessary and that every fire is a distinctive loss. Progress is being made, and the people are beginning to see that forest fires mean loss, and nothing else. So far as the Department is concerned, it does its utmost to prevent fires on reserve lands, but they will come. You know how easily a forest fire is started under favorable conditions, and how hard it is to convince people that fire will not only destroy roughage but also the forests of the State. Just so long as people will not take a reasonable view, so long we will have fires. When we begin to realize that fires mean loss, we will have fewer of them. This is the result of education. When people do not understand things, they will not deviate from an established course. When they are made wise, you will find a new response, and generally in the right direction. This has been proved with the reserves in Franklin county. When fires were once one of the most prevalent things, they are now practically unknown.

The Department has been able to do some work in assisting in the eradication of the disease that is destroying chestnut timber. You have heard something of this at your meeting. We are directed by law to do what we can. The forest reserves are being thoroughly searched for the blight and where found it is destroyed. No specific remedy has been found. The only effective thing we know today is to cut down the infected trees and burn them, even to the stump and branches. However, where the tree has marketable timber in it, the bark is removed and the wood put to commercial use.

I don't know whether you are familiar with this fungus. I have here a number of twigs of trees in which this disease is present. If you care to look at them they are here for that purpose. Now, I am not an alarmist, and do not want you to think so, but, I am confident of this one thing. That unless the chestnut blight is stopped in its march across the State, it will destroy all Pennsylvania chestnut trees, and will do it in a few years. The value of the chestnut timber is too great to let it go by the board. The Legislature saw this, provided for a Commission, and the Commission is producing results. It is known that the chestnut tree blight is not, as was at first supposed, an insect, but a fungus, which attacks the bark of the tree, cuts off the circulation, and finally girdles and thus kills the tree. In this bottle is a piece of chestnut branch covered with pustules of the blight. This has been in the bottle forty-one months, and you will see the disease still has considerable vitality. We had these bottles in Pittsburg last fall, and the tops were tied on to prevent the spread of spores. Here is a specimen which has a split in the bark on one side. Just how the split was made we don't know, but believe that the spores of the disease were carried there and then began their work right and left through the bark, until the tree was girdled. This fungus belongs to the same order of plants as the black knot on the plum trees, or the ergot in the rye fields. It is spread by means of spores carried by various means. There is this, however, that is hopeful—wherever you find infection, you will find other trees nearby where infection has not started. It does not march ahead like a column of soldiers, but goes forward and attacks in spots.

The Department is doing what it can, as already said, and only the future can tell what the result of their efforts will be. Whether it will be successful or unsuccessful we are not able to predict at this time. Suppose it be unsuccessful. We will then have the satisfaction of knowing that Pennsylvania was the only state with the courage to stand up and say in the face of the invasion of this disease, that she would not be indifferent about it, but would do what she could to prevent the destruction of one of her most valuable forest trees. If it be a failure, the whole moral effect of the effort will be of lasting benefit to the State.

Here is a piece of chestnut which I brought from Long Island in the summer of 1909. This you may handle with impunity, without danger of carrying the spores. In handling it, you will notice how punky it is. That is the result of the disease. As you go across the State this summer you will notice trees wholly or partly killed by this disease.

Now, the thing for Pennsylvania to do is to recognize fully that this thing is among us, and if there is anything to be done to protect the State, it must be done at once; not five years from now, but immediately.

I think I may say one thing more, and that is, that a joint meeting of the representatives of some twenty states is called to meet in Harrisburg the latter part of next month to consider this new situation. The problem is much more serious in the states south of us than it is with us, although we are vitally interested; and it is hoped from this meeting there will result a uniform plan of attack among the states where the disease is active.

MR. DeWITT: Will this blight attack any other forest trees?

MR. WILLIAMS: Not so far as we know. It is one of a germs of plants which there are many species. Their technical name of the germs is Diaporthe, and this is the only species we know that attacks chestnut trees.

MR. WELLER: Is there any way of detecting it on the trees at this season of the year?

MR. WILLIAMS: Yes, the appearance at this season of the year of a tree attacked by the blight is very distinctive. On the branches of the tree, you will likely find undersized dried leaves which have not fallen; near the point of infection you may find a large number of sprouts or suckers that have been thrown out by the trees on an endeavor to overcome the attack. A tree's bark is full of latent buds and when it is attacked by the disease, the interruption to sap flow forces these buds out. If you see sprouts in clusters it is indicative of an attack.

MR. BIDDLE: Is there any blight reported in Bedford county?

MR. WILLIAMS: Not so far as I know; but it is in Washington county, down near Pittsburg. I suppose the infected trees will be destroyed by this time, because the owner agreed to this.

MR. WELLER: Down in Somerset county we had samples of it in our institute a few weeks ago.

MR. WILLIAMS: It has also appeared in the other direction, in Sullivan county. It is a peculiar thing about this disease that it is sporadic, and attacks in spots, while it may not affect areas nearby.

MR. HUTCHISON: Does it not appear on the stump of the tree? I got this from a Forester of the United States. We had one of them lecture to our Pomona Grange the other day, and he told the people that even if the tree was cut down it would appear on the stumps, or even the place where the stump was removed.

MR. WILLIAMS: That is entirely true. Near Philadelphia in 1910, we found trees that originally were infected near the top; but those infected at the top also developed spores near the base of the tree. Therefore, if you find an infected tree crown you will probably find it infected also near the base, it is necessary to take the bark from the stump and burn it. Even wood from an infected tree, with the bark taken off, may carry spores for a long time. I remember a case where parts of a rail fence were made from an infected tree, and the blight grew upon the rails. It is necessary that one be careful to remove all bark from the stump, and destroy it.

MR. WELLER: You spoke of getting this from Long Island. Is there any difficulty with it there?

MR. WILLIAMS: The western part of Long Island has been practically stripped of the chestnut tree by this blight, and the park authorities east of Brooklyn, cut down last year, I think, 18,000 trees which had been attacked. It has not attacked the eastern end of the island, but at the rate it is going, it will get there too, and not a chestnut tree is likely to remain on Long Island. This specimen came out of Forest Park, Brooklyn.

The CHAIRMAN: We have one more subject; it is Mr. Hutchison.

MR. HUTCHISON: I delivered my speech yesterday.

The SECRETARY: We should like to hear a few words from our Superintendent of Public Instruction, Dr. Schaeffer.

Dr. Schaeffer spoke as follows:

ADDRESS OF DR. N. C. SCHAEFFER

I really have no speech. I enjoyed associating with the farmers, and during this week I have been "with the farmer" all the time.

If anything interests me, it is carrying agriculture into the public school. The thing that surprised me a little was, that that particular topic did not appear on the program, because I wish you could have had a chance to discuss it. By this I mean that there will be an expert in agricultural education connected with the Department of Public Instruction, and he will be able to talk with some authority.

I always come to this meeting when I can. I grew up a farmer, but my father early discovered that I would not be worth a copper as a farmer, and he allowed me to be a school master, but in my latter days I see what I missed in not studying what would make the farm attractive.

I happen to own a tract of chestnut timber that belonged to my father. I have never seen it; it is in Berks county. I also own a farm near Reading, which also belonged to him. I consider it a very profitable investment, because whenever anything has to be bought for the farm, I pay for it out of my salary, and whenever anything is sold, I put it down as profit.

I just want to say one thing: I suppose I got all the school advantages that come to a farmer's boy. When I was about ten years old, I was sent to the McAllisterville Academy, in Juniata county, and I was sent to College, and studied in three universities abroad, and some of the institutions in this country, and in all the years I was at school, I was never taught to know what would make me a better farmer. Now, I am glad there is a change coming over our schools, and this change is coming just as fast as you farmers want it to come, and not a bit faster. The idea that a lot of young girl school teachers, who are getting forty dollars a month, should accomplish anything great in teaching agriculture in the schools, is simply preposterous, and you men who represent this State Board of Agriculture, and are being taught the latest things in connection with agriculture, will have to help to get agriculture taught in some rational way in our Township High Schools. This last summer I went to a neighboring state in order to see how they did it there. Well, they had four expert lecturers, and if I wanted to kill agriculture in Pennsylvania, I would import any one of these four. One of them talked as though anybody could teach agriculture; the next one went off on the value of snakes to the farm—a subject which may do very well for Trinidad, where snakes are one of the crops. I heard a third one, who had some little idea that there might be an entering wedge for this subject; but I came home thoroughly imbued with the idea that we will have to do a little more before we can get agriculture thoroughly taught in the schools.

I am glad to have had these few minutes to throw off the feelings of my heart. I am interested in agriculture in the schools, without destroying the lengendary function of the schools, as it has come down through the ages. The school is completely out of adjustment with the conditions of today.

The SECRETARY: Mr. Chairman, we have about reached the point in our program when the farmer's bedtime approaches. Before we close, as Secretary of the State Board, as Secretary of Agriculture, as the head of the Department, and as representing the agricultural interests of Pennsylvania, I want to thank you for your faithful attendance at the meeting. I have never been more gratified than at this session, with the very regular and prompt attention with which you have been found in your places at the beginning of each session. It has been very gratifying to me.

I want to say to you that Prof. John Hamilton yesterday expressed my sentiments more fully than I can express them myself, on the great good that has been done by the Department of Agriculture. Those of you who were in the Civil War, will remember how strong we felt when we knew we were strongly reinforced, and how timid we were when we knew we had no reinforcements, and I have no doubt that Brother Martin will agree with me when I say that you have no idea what strength it gives us to know that this great body of farmers is standing behind us as a reinforcement.

I want to thank you again, in the name of the farmers of Pennsylvania, for your very regular attendance at this meeting.

Now, then, before adjournment, I want to say that, as usual, the vouchers will be sent to you, and you will make them out and return them to us, and we will send you the money.

There is so much to do that we have to come here at nine o'clock in the morning, and stay until nine or ten at night, and you have no opportunity to see the city; so the State can afford to pay your expenses for another day, if you wish to stay over and go home on Saturday. It is as little as it can do, in recognition of your services.

There are other things I would like to speak of if I had the time, but unless some one has something to say, I think we had better adjourn.

MR. GEORGE: Mr. Chairman, we have been here now for pretty nearly two days, and have not heard from our Director of Institutes. I would like to hear something from Mr. Martin.

MR. MARTIN: Mr. Chairman, and Fellow Co-workers: I can not find language to express the pleasure I have enjoyed the last two days in meeting with you here in this strong and inspiring meeting, developing so many of the problems of agriculture. But there is another side to this meeting. Most of you, I think, have looked at the chart over there, showing the statistics relative to the great work of the Farmers' Institute, which is largely the result of strong co-operative effort in the development of agriculture, and I take this opportunity, with our good Secretary of Agriculture, to express my gratification, and to wish you all a safe and pleasant journey home, to find your families enjoying good health.

The CHAIRMAN: Is there anything further. If not, a motion to adjourn will be in order.

MR. JOEL A. HERR: I move we adjourn.

This motion was properly seconded and duly carried in the regular way.

Adjourned.

N. B. Critchfield

Secretary of Agriculture.

Commonwealth of Pennsylvania.

DEPARTMENT OF AGRICULTURE—BUREAU OF CHEMISTRY

BULLETIN No. 223

COMMERCIAL FEEDING STUFFS

OF PENNSYLVANIA IN 1911

THEIR CHEMICAL AND MICROSCOPICAL EXAMINATION

JAMES W. KELLOGG, Chief Chemist

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LETTER OF TRANSMITTAL

DEPARTMENT OF AGRICULTURE
BUREAU OF CHEMISTRY

Harrisburg, March 29, 1912.

Hon. N. B. Critchfield,
Secretary of Agriculture,
Harrisburg, Pa.

Dear Sir: I have the honor to transmit herewith a report of the chemical analyses and microscopical work performed by this Bureau in the examination of samples of commercial feeding stuffs collected in the open markets of the State during 1911.

Such additional information is included in this report as was considered to be of importance.

Very respectfully,

JAMES W. KELLOGG,
Chief Chemist.

BULLETIN NO. 223.

COMMERCIAL FEEDING STUFFS

OF

PENNSYLVANIA

IN

1911

Their Chemical and Microscopical Examination

JAMES W. KELLOGG.*

INTRODUCTION.

This bulletin is a report of the work performed by the Bureau of Chemistry of the Pennsylvania Department of Agriculture in the analysis and examination of commercial feeding stuffs which were received during the year 1911. The number of official samples secured by Special Agents of the Department was 1,000, and 189 special samples were analyzed which were sent to the Bureau by manufacturers of and dealers in feeding stuffs located in Pennsylvania.

The quality of the feeding stuffs shown by the year's inspection work has steadily improved and it may be reported that the goods found for sale, as represented by the samples received, were more correctly guaranteed and cleaner in their general appearance than those which have been examined in former years. This condition was especially observed in the case of molasses feeds. In many cases, however, there is still room for improvement. The number of deficiencies, except in the case of crude protein, was proportionately less than the number of deficiencies last year. No samples were received which contained rice hulls and peanut shucks, and no adulterations of wheat offals with ground corn cobs were found. There was also a less number of samples in which the composition was improperly stated and which contained weed seeds. The smaller number of violations detected during the year lessened the number of prosecutions which were ordered by the Department.

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*Assisted by John S. Spicer, George L. Walters, Malcolm H. Ulman, Elmer C. Gildroy and W. Earl Huber. The microscopical work herein reported was performed by Mr. Spicer.

The requirements of the feeding stuff law are becoming better understood by those who deal in this commodity, and consequently the guarantees are more truly and correctly given on the sacks or attached cards. The principal violations found during the year have been false guarantees for crude protein and crude fat, an excessive amount of crude fiber where oat hulls and flax plant refuse were used and where weed seeds were used in the composition. The presence of weed seeds in feeding stuffs is largely due to the use of grain screenings from which these seeds have not been separated. Quite a number of samples were received in which weed seeds were found in varying amounts, as will be noted in the table.

A large proportion of the Dairy and Stock Feeds found upon the market to-day are composed of such by-products as ground and bolted grain screenings, flax plant refuse, oat hulls, oat middlings, oat clippings and cottonseed hulls, which are fortified with or have added thereto by-products rather high in crude portein such as, linseed meal, cottonseed meal, distillers' grains, brewers' grains, malt sprouts, gluten feed and wheat offals.

We have received many inquiries in regard to the feeding qualities and money values of such feeding stuffs, but we are not in a position to answer these inquiries satisfactorily for the reason that it is not the policy of this Department to recommend or endeavor to discredit any of the several brands of feeding stuffs which are offered for sale, unless, of course, a brand was being sold in direct violation of the law. In this case we would use every possible means to prevent the sale of such feeds.

The question as to whether or not a brand of feeding stuff composed of such or similar ingredients as are mentioned above, has a certain feeding value or gives a proper return for the money invested, is a question which every dairyman or stock breeder must decide for himself. The main facts to be considered are, the requirements of the stock to be fed, the amount of nutriment required, the price of the brands of feeding stuffs offered for sale, the value of the ingredients in these brands as compared with the by-products and whole grains which can be obtained, the cost of mixing and the cost of transportation.

The price, composition and digestibility of such by-products as are used in the compounding of dairy and stock feeds, which are low in digestable nutriments, can be ascertained and compared with other by-products giving as much or more digestible material. The analyses and the digestibility of a large number of by-products have been published from time to time in bulletins and books on the subject of stock feeding. Dairymen and stock breeders, after a careful study of this available data, ought to be able to decide for themselves whether or not they can afford to purchase ready mixed feeds or procure the ingredients separately and do their own mixing according to their requirements and the material at hand.

The usual number of requests for bulletins, copies of the law, and inquiries concerning feeding rations and nutritive ratios, were received and as far as possible these requests were granted and all inquiries were answered.

DEFINITIONS.

An attempt is being made by those in charge of the enforcement of the feeding stuff laws to bring about some uniformity in the terms for the many products used in the manufacture of feeding stuffs. The following are the definitions of the terms adopted by the Association of Feed Control Officials of the United States, in meeting at Columbus, Ohio, November 17 and 18, 1911.

MEAL is the clean, sound, ground product of the entire grain, cereal or seed which it purports to represent; Provided, that the following meals, qualified by their descriptive names, are to be known as, viz: CORN GERM MEAL is a product in the manufacture of starch, glucose and other corn products and is the germ layer from which a part of the corn oil has been extracted. LINSEED MEAL is the ground residue after extraction of part of the oil from ground flax seed.

GRITS are the hard flinty portions of Indian corn without hulls and germ.

HOMINY MEAL, HOMINY FEED, or HOMINY CHOP is a mixture of the bran coating, the germ and a part of the starchy portion of the corn kernel.

CORN FEED MEAL is the sifting obtained in the manufacture of cracked corn and table meal made from the whole grain.

CORN BRAN is the outer coating of the corn kernel.

WHEAT BRAN is the coarse outer coatings of the wheat berry.

SHORTS, or STANDARD MIDDLINGS are the fine particles of the outer and the inner bran separated from bran and white middlings.

SHIPSTUFF, or WHEAT MIXED FEED is a mixture of the products other than the flour obtained from the milling of the wheat berry.

RED DOG is a low grade wheat flour containing the finer particles of bran.

OAT GROATS are the kernels of the oat berry with the hulls removed.

OAT SHORTS are the covering of the oat grain lying immediately inside the hull, being a fuzzy material carrying with it considerable portions of the fine floury part of the groat obtained in the milling of rolled oats.

OAT MIDDLINGS are the floury portion of the groat obtained in the milling of rolled oats.

OAT HULLS are the outer chaffy coverings of the oat grain.

RICE HULLS are the outer chaffy coverings of the rice grain.

RICE BRAN is the cuticle beneath the hull.

RICE POLISH is the finely powdered material obtained in polishing the kernel.

FLAX PLANT BY-PRODUCT is that portion of the flax plant remaining after the separation of the seed, the baste fiber and a portion of the shives, and consists of flax shives, flax pods, broken and immature flax seeds and the corticle tissue of the stem.

BUCKWHEAT SHORTS, or BUCKWHEAT MIDDLINGS are that portion of the buckwheat grain immediately inside the hull after separation from the flour.

BLOOD MEAL is ground dried-blood.

MEAT SCRAP AND MEAT MEAL are the ground residues from animal tissue exclusive of hoof and bone. If they contain any considerable amount of bone, they must be designated MEAT AND BONE SCRAP, or MEAT AND BONE MEAL. If they bear a name descriptive of their kind, composition or origin, they must correspond thereto.

CRACKLINGS are the residue after partially extracting the fats and oils from the animal tissue. If they bear a name descriptive of their kind, composition or origin, they must correspond thereto.

DIGESTER TANKAGE is the residue from animal tissue exclusive of hoof and horn, specially prepared for feeding purposes by tanking under live steam, drying under high heat, and suitable grinding. If it contains any considerable amount of bone, it must be designated DIGESTER MEAT AND BONE TANKAGE.

DISTILLERS' DRIED GRAINS are the dried residue from cereals obtained in the manufacture of alcohol and distilled liquors. The product shall bear the designation indicating the cereal predominating.

BREWERS' DRIED GRAINS are the properly dried residue from cereals obtained in the manufacture of beer.

MALT SPROUTS are the sprouts of the barley grain. If the sprouts are derived from any other malted cereal, the source must be designated.

ALFALFA MEAL is the entire alfalfa hay ground, and does not contain an admixture of ground alfalfa straw or other foreign materials.

CHOP is a ground or chop feed composed of one or more different cereals or by-products thereof. If it bears a name descriptive of the kind of cereals, it must be made exclusively of the entire grains of those cereals.

SCREENINGS are the smaller imperfect grains, weed seeds and other foreign material having feeding value, separated in cleaning the grain.

The following terms were referred to the executive committee by the association for further consideration: "Oat Clippings," "White Wheat Middlings," "Gluten Meal," "Gluten Feed," and "Cottonseed Meal."

ACKNOWLEDGEMENTS.

We wish to extend our sincere thanks to the Secretary of Agriculture, Hon. N. B. Critchfield, for the many courtesies received and for the untiring interest devoted to the work of the Bureau of Chemistry.

Our thanks are also extended to our General Agent, Mr. G. G. Hutchison, to the Special Agents, to each member of the Bureau Staff, to the Manufacturers of and Dealers in feeding stuffs, and to the Trade Journals and Associations whose co-operation has assisted greatly to the success of the year's work.

ANALYSES OF SAMPLES OF FEEDING STUFFS RECEIVED FROM MANUFACTURERS AND PURCHASERS LOCATED IN PENNSYLVANIA.

The Feeding Stuff law by a special provision makes it possible for manufacturers and purchasers of feeding stuffs to have samples analyzed by this Bureau for the fee of one dollar per sample. During the year, 189 special samples of feeding stuffs were sent to the Bureau for analysis by residents of Pennsylvania. Analyses were made on all these samples and a report in each case made to the parties sending the same. The fees received were covered into the State Treasury in the usual manner. A number of samples were also rceived in which requests were made in regard to their general appearances, in which no analyses were requested. And as far as possible all these requests were complied with.

In the following table (No. I) is given the results of the analyses of these special samples together with the names of the parties from whom they were received, and the brand names of the feeding stuffs.

TABLE I.—ANALYSES OF SAMPLES OF FEEDING STUFFS RECEIVED FROM MANUFACTURERS AND PURCHASERS LOCATED IN PENNSYLVANIA.

Chief Chemist's number.	Name of Feeding Stuff.	Received From—	Crude protein.	Crude fat.	Crude fiber.
			Per ct.	Per ct.	Per ct.
F 1101	Alfalfa feed,	Geo. Egolf & Co., Philadelphia,	12.50	3.79	13.16
F 1102	White hominy feed.	C. V. Adams, Lancaster,	10.41	9.90	3.18
F 1103	Romeo Chick Feed,	G. W. Moore & Co., Moore,	11.50	4.23	2.83
F 1104	Buffalo gluten feed,	A. E. Hershey, Derry Church,	26.88	3.82	6.90
F 1105	Quaker Dairy Molasses Feed,	A. E. Hershey, Derry Church,	13.47	4.67	14.38
F 1106	Beef scraps,	Pittsburg Provision and Packing Co., Pittsburg.	36.91	14.73	2.73
F 1107	Beef meal,	Pittsburg Provision and Packing Co., Pittsburg.	32.25	22.22	2.57
F 1108	Poultry bone,	Pittsburg Provision and Packing Co., Pittsburg.	26.31	1.82	--------
F 1109	Dyer's Hen Feed,	F. H. Dyer, Lock Haven,	11.53	3.80	3.36
F 1110	Cottonseed meal,	Equity Co-Operative Exchange, Wellsboro.	40.82	9.30	7.24
F 1111	Brewers' dried grains,	C. R. Rosenberger, Colmar,	23.85	7.15	14.35
F 1112	Distillers' dried grains,	The Large Distilling Co., West Elizabeth.	16.35	9.00	14.68
F 1113	Cottonseed meal,	Leonhard Ritter, St. Marys,	41.10	8.30	8.11
F 1114	Cottonseed meal,	S. F. Peckman, Williamson,	42.03	7.84	7.63
F 1115	Dyer's Dry Mash for Poultry,	F. H. Dyer, Lock Haven,	19.38	5.00	7.68
F 1116	Scratch feed,	White Oak Milling Co., Holsopple.	11.03	3.05	3.43
F 1117	Flaxseed,	McIlvaine Bros., Philadelphia,	23.78	39.66	5.88
F 1118	Gluten feed,	Thomas Haines & Co., Malvern,	20.31	5 87	7.13
F 1119	Alfalfa meal,	Dwight E. Hamlin, Pittsburg,	13.16	2.06	30.19
F 1120	Poultry feed,	J. F. Lantz, Malvern,	13.85	3.56	4.65
F 1121	Gluten feed "A,"	F. S. Wertz & Co., Reading,	25.03	4.16	7.09
F 1122	Gluten feed "B,"	F. S. Wertz & Co., Reading,	19.41	6.12	6.55
F 1123	Peanut meal,	John W. Duller, West Chester,	35.38	10.30	4.92
F 1124	Peerless Molasses Cattle Feed.	Richardson Bros., Philadelphia,	10,51	1.46	9.97
F 1125	Peerless Molasses Horse and Mule Feed.	Richardson Bros., Philadelphia,	8.05	1.74	10.19
F 1126	Penn Dairy Feed,	Seaboard Mills, Reading,	10.97	4.28	5.87
F 1127	Chicken feed,	Edwin F. Stover, Blooming Glen.	7.91	2.33	1.69
F 1128	Cottonseed feed,	Jno. R. Burkholder, Lancaster,	12.41	2.76	32.35
F 1129	Flaxseed meal,	McIlvaine Bros., Philadelphia,	25.12	35.47	5.75
F 1130	Puritan Mash Feed,	C. E. Boger, Lebanon,	13.72	6.05	9.87
F 1131	"Food,"	Jersey Cereal Food Co., Cereal,	7.41	0.63	0.85
F 1132	"Food No. 2,"	Jersey Cereal Food Co., Cereal,	8.16	0.74	0.66
F 1133	Primo Regulator and Renovating Powder for Horses.	I. L. Nailor, Harrisburg,	20.72	7.72	9.21
F 1134	Rye distillers' grains,	Hamburger Distillery, Ltd., Pittsburg.	15.47	9.51	13.97
F 1135	Distillers' dried grains,	Equity Co-Operative Exchange, Wellsboro.	32.57	13.92	10.92
F 1136	Chick feed,	Mann & Allshouse, Easton,	13.31	3.55	3.27
F 1137	Gluten feed,	H. S. Shelly, Allentown,	26.00	3.72	7.75
F 1138	Cottonseed meal, No. 11998,	M. F. Baringer, Philadelphia,	39.88	8.78	8.97
F 1139	Distillers' dried grains,	Hamburger Distillery, Ltd., Pittsburg.	26.63	9.94	12.75
F 1140	Eagle 3 D Dewey's distillers' grains.	Equity Co-operative Exchange, Wellsboro.	31.81	14.47	12.15
F 1141	Beiler's Mixed Feed,	J. K. Beiler, Elk Lick,	17.75	5.48	7.85
F 1142	Wild Rose Stock Food,	McDonald Milling Co., McDonald.	9.63	3.85	8.02
F 1143	Peanut oil cake meal,	The National Farm School, Farm School.	33.94	12.58	4.71
F 1144	Buckwheat feed,	The National Farm School, Farm School.	21.06	5.14	7.11
F 1145	Baby Chick Feed,	R. S. McCague, Pittsburg,	9.69	3.39	3.77
F 1146	No. 1 Chop,	Curtin Milling Co., Curtin,	13.63	4.20	4.35
F 1147	No. 2 Chop,	Curtin Milling Co., Curtin,	9.13	3.55	6.00
F 1148	No. 3 Middlings,	Curtin Milling Co., Curtin,	15.69	3.23	3.37
F 1149	Gluten feed No. 10,	C. W. Wagar & Co., Philadelphia.	26.81	4.91	7.17
F 1150	Gluten feed "D. B. G.,"	C. W. Wagar & Co., Philadelphia.	29.94	6.38	14.35
F 1151	Chop feed,	Clayton Etters, Oak Hall Station.	9.63	3.69	6.55
F 1152	No. 1 Chop,	E. D. Clark, Altoona,	13.13	3.57	5.40

TABLE I.—Continued.

Chief Chemist's number.	Name of Feeding Stuff.	Received From—	Crude protein.	Crude fat.	Crude fiber.
			Per ct.	Per ct.	Per ct.
F 1153	No. 2 Chop,	E. D. Clark, Altoona,	13.69	4.84	4.93
F 1154	Mixed Chicken feed,	Millard & Seureman, Kingston,	11.44	3.34	4.93
F 1155	Cottonseed meal,	J. Harry Rakestraw, Williamsport.	41.38	7.80	9.85
F 1156	Gluten feed, "R No. 1,"	C. W. Wagar & Co., Piladelphia.	26.94	2.92	6.29
F 1157	Gluten feed, "C No. 2,"	C. W. Wagar & Co., Philadelphia.	27.31	3.77	7.95
F 1158	Gluten feed, "KB No. 3,"	C. W. Wagar & Co., Philadelphia.	29.81	2.60	7.02
F 1159	Gluten feed, "U No. 4,"	C. W. Wagar & Co., Philadelphia.	25.13	5.35	7.51
F 1160	Gluten feed, "SB,"	C. W. Wagar & Co., Philadelphia.	26.69	3.45	7.77
F 1161	Chop feed,	Keystone Roller Mills, Macungie,	11.94	4.32	3.22
F 1162	Gluten feed, No. 20,	C. W. Wagar & Co., Philadelphia.	25.25	3.35	6.16
F 1163	Stock food base,	Pittsburg Provision and Packing Co., Pittsburg.	5.94	3.08	36.18
F 1164	Rye offal,	G. M. Roueche, Meadville,	30.25	8.98	3.57
F 1165	Gluten feed,	C. V. Adams, Lancaster,	26.38	3.07	6.80
F 1166	Buffalo gluten feed,	C. V. Adams, Lancaster,	27.88	3.45	5.87
F 1167	Dry mash chicken feed,	White Oak Milling Co., Holsopple.	18.25	4.95	7.06
F 1168	Chick feed,	White Oak Milling Co., Holsopple.	11.00	3.04	2.76
F 1169	Hen food,	Hunter & Son, Ashland,	11.31	3.67	4.31
F 1170	Chick food,	Hunter & Son, Ashland,	11.56	3.23	2.49
F 1171	Matchless Egg Maker,	Isaac Freed, Harrisburg,	15.81	6.29	3.68
F 1172	Little Jewel Chick Feed,	Isaac Freed, Harrisburg,	14.44	6.61	4.42
F 1173	Scratch feed,	Isaac Freed, Harrisburg,	11.50	3.69	3.22
F 1174	Cottonseed meal (car number 15705).	Jonas F. Eby & Son, Lancaster.	40.94	8.08	9.38
F 1175	Poultry grain,	W. A. Weller, Athens,	10.06	3.25	3.56
F 1176	Gluten feed "H,"	C. W. Wagar & Co., Philadelphia.	19.25	4.53	7.81
F 1177	Gluten feed "P,"	C. W. Wagar & Co., Philadelphia.	26.50	2.95	6.62
F 1178	Chick feed,	Keystone Commercial Co., Pittsburg.	10.75	2.97	2.22
F 1179	Mash feed,	I. S. Fry, Reading,	17.44	7.00	6.13
F 1180	Hominy feed,	F. Z. Stauffer, York,	11.06	7.28	3.26
F 1181	McDonald feed,	McDonald Milling Co., McDonald.	8.38	3.81	8.98
F 1182	Mixed feed,	Blank & Gottshall, Sunbury,	12.25	4.88	5.22
F 1183	Flour and oats chop,	Blank & Gottshall, Sunbury,	14.69	4.22	6.56
F 1184	Hen-o-la Poultry Mash,	O. L. Romberger, Harrisburg,	12.72	3.20	3.76
F 1185	Hen-o-la Chick Feed,	O. L. Romberger, Harrisburg,	10.10	2.16	1.65
F 1186	No. 1 S. & S. Feed,	Godfrey Shmidheiser & Co., Philadelphia.	11.03	4.45	5.59
F 1187	No. 2 S. & S. Feed,	Godfrey Shmidheiser & Co., Philadelphia.	11.94	4.76	7.07
F 1188	No. 3 S. & S. Feed,	Godfrey Shmidheiser & Co., Philadelphia.	11.66	4.55	6.02
F 1189	Shredded wheat waste,	John W. Eshelman, Lancaster,	11.16	2.49	2.12
F 1190	Offal,	John W. Eshelman, Lancaster,	12.44	4.24	5.04
F 1191	John Hen Poultry Feed,	Keystone Commercial Co., Pittsburg.	10.50	2.74	2.58
F 1192	Distillers' dried grains,	H. E. Dooley & Son, York,	32.38	15.32	12.81
F 1193	Colonial Food Digester,	Fred H. Risley, Springville,	25.75	3.64	10.92
F 1194	Hemmerly's Condition Powder.	J. W. Hemmerly, Hazleton,	14.81	6.24	8.70
F 1195	Feed,	J. B. Parnell, Confluence,	13.81	5.05	4.82
F 1196	Scratching grains,	F. V. Perry, Scottdale,	10.44	3.78	3.15
F 1197	Eureka Chicken Feed,	Good Times Supply Co., Galeton.	11.31	3.45	4.05
F 1198	Scratch feed,	McFarland Supply Co., Greensburg	9.56	3.65	2.48
F 1199	Wyoming Poultry Powder,	The Supply Co., Moosic,	35.44	6.05	9.97
F 1200	Wyoming Stock Powder,	The Supply Co., Moosic,	35.44	7.02	8.93
F 1201	Alfalfa Horse Feed,	F. V. Perry, Scottdale,	13.75	4.91	6.53
F 1202	Cottonseed meal,	Richardson Bros., Philadelphia,	37.69	8.49	10.53

TABLE I.—Continued.

Chief Chemist's number.	Name of Feeding Stuff.	Received From—	Crude protein.	Crude fat.	Crude fiber.
			Per ct.	Per ct.	Per ct.
F 1203	"A" Hominy feed,	Miner Hilliard Milling Co., Wilkes-Barre.	11.06	6.57	4.32
F 1204	"B" Hominy feed,	Miner Hillard Milling Co., Wilkes-Barre.	11.56	6.78	4.46
F 1205	"H" Hominy feed,	Miner Hillard Milling Co., Wilkes-Barre.	10.28	6.70	2.97
F 1206	"M" Hominy feed,	Miner Hillard Milling Co., Wilkes-Barre.	10.38	6.34	6.04
F 1207	Mixed feed,	Spanogle Yeager Milling Co., Lewistown.	11.35	3.82	8.70
F 1208	Nixed feed,	Spanogle Yeager Milling Co., Lewistown.	15.10	4.39	3.02
F 1209	Hen food,	Millard & Scureman, Kingston,	11.03	3.35	3.95
F 1210	Molasses,	M. F. Baringer, Philadelphia,	3.19	0.07	--------
F 1211	Gluten feed, No. 18501,	M. F. Baringer, Philadelphia,	25.25	2.51	6.86
F 1212	Alfalfa Horse & Cow Chop,	G. W. Moore & Co., Moore,	11.31	3.63	10.48
F 1213	Matchless Egg Maker,	Isaac Freed, Harrisburg,	12.69	4.89	3.37
F 1214	Developing food,	Blank & Gottshall, Sunbury,	11.56	3.28	2.27
F 1215	Cottonseed meal,	Aug. C. Wertz & Bro., Reading.	37.94	8.25	10.22
F 1216	Eshelman's Home-Made Dairy Feed.	John W. Eshelman, Lancaster,	22.50	5.66	9.83
F 1217	Prepared Meat for Poultry,	The Fritz Co., Philadelphia,	63.31	14.99	1.19
F 1218	Mixed feed,	Newlins Milling Co., Nazareth,	9.81	3.81	6.49
F 1219	Dry Mash Poultry Food,	Brooks Milling Co., Inc., Altoona.	19.94	5.56	10.07
F 1220	Chick feed,	Keystone Commercial Co., Pittsburg.	9.75	4.39	3.04
F 1221	McDonald feed,	McDonald Milling Co., McDonald.	10.50	4.84	8.16
F 1222	Brewers' dried yeast,	D. R. Worman, Philadelphia,	52.38	0.80	4.03
F 1223	Dandy Scratch Feed,	Strunk & Moyer, Reading,	11.81	4.53	4.31
F 1224	Antwerp Pigeon Feed,	Strunk & Moyer, Reading,	14.81	4.43	4.43
F 1225	Corn and cob meal,	Elkland Roller Mills, Elkland,	9.03	3.49	8.17
F 1226	Corn, oats and oat hulls,	Elkland Roller Mills, Elkland,	10.19	3.98	4.77
F 1227	Dairy feed,	Kift Milling Co., Sunbury,	17.28	5.34	9.52
F 1228	Clover Leaf Scratch Feed,	McDonald Milling Co., McDonald.	10.16	3.83	2.97
F 1229	Dry Mash for Poultry,	Samuel Brubaker Powder and Food Co., Lancaster.	21.19	6.19	5.75
F 1230	Brewers' dried grains,	Fuhrman & Schmidt Brewing Co., Inc., Shamokin.	25.50	7.39	14.43
F 1231	Kift's Creamery Dairy Feed,	Kift Milling Co., Sunbury,	21.50	5.70	10.68
F 1232	H. & S. Alfalfa Feed,	Dwight E. Hamlin, Pittsburg,	17.16	5.44	13.22
F 1233	Buckwheat middlings,	Dayton Milling Co., Towanda,	30.31	8.09	10.31
F 1234	Toepfer's Mixed Feed,	R. J. Toepfer, Tarentum,	10.38	3.67	10.00
F 1235	Meat scraps,	The Fritz Co., Philadelphia,	45.16	14.85	1.60
F 1236	Cottonseed meal No. 1,	E. G. Campbell, Keisters,	*	*	*
F 1237	Cottonseed meal No. 2,	E. G. Campbell, Keisters,	*	*	*
F 1238	Dry mash,	Spanogle Yeager Milling Co., Lewistown.	24.13	5.80	6.92
F 1239	B. B. Poultry Mash,	J. F. Lantz, West Chester,	13.56	3.03	4.61
F 1240	Toepfer's Mixed Feed,	R. J. Toepfer, Tarentum,	11.19	3.75	10.01
F 1241	Langdon's Scratch Grains,	W. H. Langdon, Altoona,	11.50	3.63	4.24
F 1242	Langdon's Poultry Mash,	W. H. Langdon, Altoona,	18.94	5.83	7.20
F 1243	Buckwheat bran,	Dayton Milling Co., Towanda,	6.50	1.35	41.63
F 1244	Diamond gluten meal,	J. F. Lantz, West Chester,	45.00	2.50	1.67
F 1245	Buckwheat feed,	Elkland Roller Mills, Elkland,	21.31	4.80	18.25
F 1246	John Hen Poultry Meat Mash.	Keystone Commercial Co., Pittsburg.	12.69	4.96	5.17
F 1247	Boveta cottonseed feed,	Branthoffer & Nelson, Thompsontown.	13.13	2.75	32.03
F 1248	Stock feed,	Scranton Flour and Grain Co., Scranton.	10.31	4.25	6.00
F 1249	Buckwheat middlings,	H. J. Klingler & Co., Butler,	21.06	5.12	23.76
F 1250	Buckwheat shorts,	H. J. Klingler & Co., Butler,	4.50	1.00	42.69
F 1251	Buckwheat feed, No. 1,	Johnson & Co., Franklin,	32.25	7.88	5.45
F 1252	Buckwheat feed, No. 2,	Johnson & Co., Franklin,	21.44	5.28	20.36
F 1253	Buckwheat middlings,	Sun Milling Co., Mansfield,	34.81	8.38	6.39
F 1254	Buckwheat middlings, "D,"	Dayton Milling Co., Towanda,	24.50	5.90	15.00

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*Refused to remit analysis fee. Results not reported.

TABLE I.—Concluded.

Chief Chemist's number.	Name of Feeding Stuff.	Received From—	Crude protein.	Crude fat.	Crude fiber.
			Per ct.	Per ct.	Per ct.
F 1255	Dirigo Brand cottonseed meal.	D. W. Foust & Sons, Chambersburg.	41.06	8.09	8.75
F 1256	Beef scraps,	Quaker City Mfg. Co., Philadelphia.	52.72	11.00	0.76
F 1257	Chick feed,	M. E. Yost, Doylestown,	12.94	3.14	2.50
F 1258	Life Saving Little Chick Food.	M. E. Yost, Doylestown,	12.31	2.48	3.17
F 1259	Perfection Mash Feed,	M. E. Yost, Doylestown,	16.13	3.63	7.37
F 1260	F. P. C. Developing Chick Feed.	F. P. Cassel & Son, Lansdale,	12.00	3.47	2.43
F 1261	F. P. C. Standard Poultry Mash Food.	F. P. Cassel & Son, Lansdale,	17.94	5.29	8.60
F 1262	Schmueker's Dairy Feed,	C. E. Schmucker, Watsontown,	30.56	6.28	12.05
F 1263	Cottonseed feed,	M. F. Baringer, Philadelphia,	26.56	7.69	19.28
F 1264	Creamery Dairy Feed,	Kift Milling Co., Sunbury,	24.69	6.03	11.96
F 1265	Buckwheat middlings,	H. J. Klingler & Co., Butler,	17.56	4.00	28.02
F 1266	Cottonseed meal,	F. E. Farabaugh, Patton,	41.94	9.53	6.87
F 1267	Cottonseed meal,	Geo. Walker, Chambersburg,	40.44	9.13	8.90
F 1268	Buckwheat feed,	Dayton Milling Co., Towanda,	18.31	4.07	20.31
F 1269	Dairy Feed, No. 1,	Banner Roller Mills, Elizabeth,	17.88	5.18	14.57
F 1270	Dairy feed, No. 2,	Banner Roller Mills, Elizabeth,	16.00	4.58	13.63
F 1271	O. P. linseed cake meal,	C. W. Wagar & Co., Philadelphia.	33.94	7.40	9.04
F 1272	Hard wheat bran,	Richardson Bros., Philadelphia,	16.88	5.12	10.08
F 1273	Hard wheat middlings,	Richardson Bros., Philadelphia,	18.75	5.53	9.33
F 1274	Soft wheat bran,	Richardson Bros., Philadelphia,	16.00	4.66	9.21
F 1275	Soft wheat middlings,	Richardson Bros., Philadelphia,	15.81	3.93	5.13
F 1276	Federal Stock Food,	Federal Stock Food Co., Mifflinburg.	8.94	3.02	30.47
F 1277	Federal Poultry Food,	Federal Stock Food Co., Mifflinburg.	6.13	1.93	18.52
F 1278	Beef scraps,	The Fritz Company, Philadelphia.	45.30	12.35	1.84
F 1279	Quaker Brand Scratch Feed,	The Philadelphia Seed Co., Philadelphia.	11.69	4.44	3.54
F 1280	Quaker Brand Laying Mash Feed.	The Philadelphia Seed Co., Philadelphia.	24.81	6.80	8.81
F 1281	Buckwheat middlings,	H. J. Klingler & Co., Butler,	20.00	4.73	24.87
F 1282	Brewers' dried grains, No. 1,	Stegmaier Brewing Co., Wilkes-Barre.	23.75	7.23	16.91
F 1283	Cottonseed meal,	C. P. Yarnall, Kelton,	40.00	7.38	12.39
F 1284	Florida cottonseed feed,	M. F. Baringer, Philadelphia,	19.88	5.96	23.26
F 1285	Cottonseed meal,	S. K. Chambers & Co., Westgrove.	39.88	7.04	12.67
F 1286	Brewers' dried grains, No. 2,	Stegmaier Brewing Co., Wilkes-Barre.	25.19	6.78	16.13
F 1287	Dairy Feed,	A. H. Cleveland, Philadelphia,	17.00	5.32	14.51
F 1288	Brewers' dried grains, No. 3,	Stegmaier Brewing Co., Wilkes-Barre.	24.81	6.74	14.72
F 1289	Dixie Brand cottonseed meal,	J. C. Harrington, Montrose,	39.75	7.68	10.40

OFFICIAL SAMPLES OF FEEDING STUFFS OBTAINED BY SPECIAL AGENTS.

In compliance with the requirements of the feeding stuff law the Department of Agriculture sent out Special Agents to obtain samples of feeding stuffs for analysis and examination. During the year 1911 these Agents visited 327 towns and cities in 56 counties of Pennsylvania and secured 1,000 samples which were sent to the Bureau of Chemistry. All of these samples were subjected to a chemical analysis and were examined microscopically. In the following pages will be found the results obtained, together with other information including a discussion of each class of feeding stuffs received.

In the following table (No. II) the number of counties visited and the number of samples secured in each are given.

TABLE II.—COUNTIES VISITED AND NUMBER OF SAMPLES SECURED IN EACH.

Name of County.	Number of Samples.
Adams,	1
Allegheny,	65
Armstrong,	17
Beaver,	17
Bedford,	14
Berks,	17
Blair,	30
Bradford,	25
Bucks,	22
Butler,	14
Cambria,	25
Cameron,	8
Carbon,	1
Centre,	8
Chester,	31
Clearfield,	32
Clarion,	3
Clinton,	7
Columbia,	9
Crawford,	14
Cumberland,	15
Dauphin,	10
Delaware,	14
Elk,	17
Erie,	27
Fayette,	22
Forest,	3
Huntingdon,	12
Indiana,	15
Jefferson,	11
Juniata,	5
Lackawanna,	1
Lancaster,	74
Lawrence,	16
Lebanon,	29
Lehigh,	15
Lycoming,	24
McKean,	19

TABLE II.—Concluded.

Name of County.	Number of Samples.
Mercer,	12
Mifflin,	21
Monroe,	1
Montgomery,	61
Northumberland,	25
Potter,	6
Somerset,	15
Susquehanna,	4
Tioga,	16
Venango,	21
Wayne,	1
Warren,	6
Washington,	34
Westmoreland,	55
Wyoming,	4
York,	29
Total,	1,000

In the following table (No. III) is shown the classification of feeding stuffs and the number of samples in each class which were received.

TABLE III.—CLASSIFICATION OF SAMPLES ANALYZED.

Name of Feeding Stuff.	Number of Samples.
Cottonseed meal,	53
Linseed meal, N. P.,	4
Linseed meal, O. P.,	55
Linseed meal with admixtures,	3
Corn oil meal,	1
Distillers' grains,	21
Brewers' grains,	25
Malt sprouts,	7
Gluten feed,	44
Hominy feed,	26
Corn bran,	13
Corn flour,	1
Low grade flour,	7
Wheat middlings,	59
Wheat middlings with admixtures,	5
Mixed feed—wheat by-products,	4
Wheat bran,	76
Rye middlings,	3
Mixed feed—rye by-products,	1
Wheat and rye offals,	2
Buckwheat middlings,	2
Buckwheat feed,	1
Alfalfa meal,	16
Beet pulp,	14
Proprietary dairy and stock feeds,	237
Proprietary horse and mule feeds,	38
Calf meals,	10
Miscellaneous feeds,	5
Miscellaneous chop feeds,	108
Proprietary poultry foods,	140
Animal by-products,	7
Condimental stock and poultry foods,	12
Total,	1,000

GUARANTEES AND DEFICIENCIES.

In the following table (No. IV) is shown the number of samples of feeding stuffs received as classified in Table No. III, together with the number of samples in each class which were guaranteed for crude protein, crude fat and crude fiber, the number which were found to be deficient in both crude protein and crude fat, the number deficient in crude protein alone and the number deficient in crude fat alone. In the preparation of this table the deficiencies reported were only those where the content of crude protein was found to be one per cent. or or more below and the content of crude fat one-half of one per cent. or more below the respective guarantees for these constituents. Out of the 1,000 samples analyzed, 852 were guaranteed for crude protein and crude fat; of these, 6 or 0.70 per cent. were found to be deficient in both crude protein and crude fat; 46 or 5.40 per cent. were deficient in crude protein alone and 26 or 3.05 per cent. were deficient in crude fat alone. The total number of those deficient in crude protein was 52 or 6.10 per cent. and the total number deficient in crude fat was 32 or 3.75 per cent.

It may be fairly stated that the number of deficiencies, where the analysis was found to be slightly below their guarantees, was less than the number observed during last year.

TABLE IV.—SUMMARY OF DEFICIENCIES IN 1911.

Name of Feeding Stuffs.	Number of samples analyzed.	Number of samples guaranteed.	Deficient in protein and fat.	Deficient in protein alone.	Deficient in fat alone.
Cottonseed meal,	53	53	--------	8	2
Linseed meal, N. P.,	4	4	--------	--------	--------
Linseed meal, O. P.,	55	55	--------	2	1
Linseed meal with admixtures,	3	3	--------	--------	--------
Corn oil meal,	1	1	--------	1	--------
Distillers' grains,	21	21	--------	1	--------
Brewers' grains,	25	21	--------	--------	--------
Malt sprouts,	7	7	--------	--------	--------
Gluten feed,	44	43	1	1	4
Hominy feed,	26	26	--------	--------	2
Corn bran,	13	13	--------	--------	--------
Corn flour,	1	1	1	--------	--------
Low grade flour,	7	4	--------	--------	--------
Wheat middlings,	59	28	--------	--------	2
Wheat middlings with admixtures,	5	5	--------	--------	--------
Mixed feed—wheat by-products,	4	4	--------	--------	--------
Wheat bran,	76	51	--------	--------	1
Rye middlings,	3	3	--------	--------	1
Mixed feed—rye by-products,	1	1	--------	--------	--------
Wheat and rye offals,	2	1	--------	--------	--------

TABLE IV.—Continued.

Name of Feeding Stuffs.	Number of samples analyzed.	Number of samples guaranteed.	Deficient in protein and fat.	Deficient in protein alone.	Deficient in fat alone.
Buckwheat middlings,	2				
Buckwheat feed,	1	1	1		
Alfalfa meal,	16	16			
Beet pulp,	14	14			
Proprietary dairy and stock feeds,	237	237		20	3
Proprietary horse and mule feeds,	38	38			
Calf meals,	10	10	1		
Miscellaneous feeds,	5	2			
Miscellaneous chop feeds,	108	57	1	1	1
Proprietary poultry foods,	140	118	1	9	8
Animal by-products,	7	7		3	
Condimental stock and poultry foods,	12	7			
Total,	1,000	852	6	46	26

The following table (No. V) has been prepared to show the general decrease of deficiencies which have been observed during 1911, and the five years preceding. It will be noted that there has been a general decrease in the number of deficiencies during the past six years except in the case of crude protein alone which seems to remain somewhat in excess of that found in 1909 although less than in 1910. This decrease in the number of deficiencies is undoubtedly due to the fact that the feeding stuffs law is becoming better understood by the general public and the manufacturers are guaranteeing their products more correctly than was done during the first years of the enforcement of the law.

TABLE V.—DECREASE OF DEFICIENCIES.

	1906.	1907.	1908.	1909.	1910.	1911.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
Deficient in crude protein and crude fat,	13.66	3.80	2.31	1.61	1.37	0.70
Deficient in crude protein alone,	32.37	11.95	8.00	3.70	6.69	5.40
Deficient in crude fat alone,	1.43	6.25	4.74	3.88	2.50	3.05
Total deficient in crude protein,	46.00	15.00	10.33	5.31	8.06	6.10
Total deficient in crude fat,	15.00	10.00	7.06	5.50	3.87	3.75

CLASSIFICATION, AVERAGE PARTIAL COMPOSITION AND RETAIL PRICE.

In the following table (No. VI) the average partial composition and retail price of the feeding stuffs analyzed during the year are shown. They are arranged in classes according to their content of crude protein, as suggested by Jordan & Jenter. The figures reported are the averages of two or more of the same brand of feeding stuffs, as will be found in Table No. VII.

TABLE VI.—AVERAGE ANALYSIS AND RETAIL PRICE.

Name of Feeding Stuff.	Protein.	Fat.	Fiber.	Price per ton.
	Per ct.	Per ct.	Per ct.	
Class 1 (30 Per Cent.-45 Per Cent. Protein).				
Cottonseed meal,	41.19	8.34	8.65	$33 98
Linseed meal, N. P.,	37.50	2.38	8.74	41 50
Linseed meal, O. P.,	35.31	6.46	8.17	41 72
McMahn's Concentrated Protein Feed,	32.31	7.02	12.52	30 00
Class 2 (20 Per Cent.-30 Per Cent. Protein).				
Distillers' grains (largely from corn),	29.87	13.47	11.16	30 76
Buckwheat middlings,	27.94	7.46	3.61	29 00
Brewers' grains,	27.82	7.59	13.98	26 24
Laxo Cake Meal,	27.46	8.36	9.49	42 67
Unicorn Dairy Ration,	26.94	6.71	9.39	30 50
Gregson's Calf Meal,	26.75	6.42	5.35	60 00
Sugarota Calf Meal,	26.56	6.03	3.50	70 00
McMahn's Milk and Muscle Producer,	26.31	6.60	10.47	28 00
Malt sprouts,	25.50	3.04	12.07	26 21
Ubiko Union Grains,	25.36	8.32	9.26	31 19
Gluten feed,	25.13	3.96	6.71	28 43
Blue Ribbon Dairy Feed,	24.93	4.89	10.08	31 00
Blatchford's Calf Meal,	24.29	5.10	6.19	76 00
Molasses Flakes,	23.22	9.24	10.84	31 25
Husted's Molasses Feed,	21.71	5.33	8.52	27 67
Class 3 (14 Per Cent.-20 Per Cent. Protein).				
Schumacher Calf Meal,	19.58	8.59	2.76	70 00
Dry Mash (Park & Pollard Co.),	18.84	4.35	7.40	53 60
Low grade flour,	18.54	4.41	2.27	34 43
Distillers' grains (largely from rye),	18.14	9.70	13.23	30 25
Purina Chicken Chowder,	18.13	4.63	7.37	47 80
Ubiko Horse and Stock Feed,	18.07	7.07	8.11	30 25
Boveta Brand Cottonseed Hull and Meal Mixture,	17.56	3.69	28.02	25 17
Rye middlings,	17.46	3.32	4.24	28 00
Wheat middlings,	17.43	4.52	4.86	30 98
International Dairy Feed,	17.42	5.54	12.88	28 00
Sugarine Dairy Feed,	17.25	4.99	12.17	26 50
Crystaloid Dairy Feed,	17.21	4.87	12.25	23 00
Buckeye Mixed Feed,	17.05	5.23	7.84	29 20
Hammond Dairy Feed,	17.05	4.79	10.63	25 86
Badger Dairy Feed,	16.89	3.48	13.39	25 71
Mixed Feed—Wheat by-products,	16.80	4.79	6.63	26 25
Red Comb Meal Mash,	16.69	4.59	7.28	40 00
Sucrene Dairy Feed,	16.56	5.03	11.78	25 50
Wheat bran,	16.41	5.02	9.22	28 68
Mixed feed—Rye by-product,	15.81	3.75	3.85	28 00
Sugarota Dairy Feed,	15.79	5.46	14.16	26 50

TABLE VI.—Concluded.

Name of Feeding Stuff.	Protein.	Fat.	Fiber.	Price per ton.
	Per ct.	Per ct.	Per ct.	
Molac Horse Feed,	15.56	3.70	10.12	32 50
No. 2 White Middlings and Corn Meal,	15.15	4.96	4.66	35 00
Gritless Chick Food (Park & Pollard Co.),	15.08	4.15	2.64	51 60
Buckwheat feed,	14.94	3.62	19.67	27 00
Alfalfa meal,	14.86	2.47	29.53	30 46
International Special Molasses Feed,	14.69	5.74	13.23	24 33
Quaker Dairy Molasses Feed,	14.57	4.70	12.95	26 40
Corn oil meal,	14.50	9.35	5.95	28 00
Growing Feed (Park & Pollard Co.),	14.44	3.80	4.04	49 00
Otto Weiss Alfalfa Oats Food,	14.10	4.23	12.00	34 00
Class 4 (8 Per Cent.-14 Per Cent. Protein).				
Purina Mill Feed Pigeon Size,	13.25	3.01	2.87	50 00
Sterling Chick Feed,	12.88	2.95	2.09	42 60
Sucrene Alfalfa Horse and Mule Feed,	12.34	4.02	15.04	32 00
Chicken Feed Chick Size,	12.13	3.19	2.57	50 00
Queen Poultry Mash,	11.94	3.93	6.46	32 60
Badger Alfalfa Horse and Mule Feed,	11.90	3.63	9.08	32 34
Schumacher Scratching Grains,	11.86	4.11	3.05	40 00
Globe Scratch Feed,	11.82	3.38	2.95	39 00
Purina Mill Feed Scratch Size,	11.77	3.63	2.89	40 00
Red Ribbon Chick Food,	11.77	3.52	1.80	43 00
Sucrene Horse and Mule Feed,	11.76	3.63	10.14	27 50
Purina Mill Feed Chick Size,	11.63	3.79	2.69	42 20
Sterling Scratch Feed,	11.50	3.55	2.34	41 00
Kornfalfa Feed,	11.44	3.82	11.85	34 60
Premier Scratch Feed,	11.40	3.76	2.46	43 33
Steinmesch Mixed Feed Hen Size,	11.32	3.28	2.96	49 00
Rye chops,	11.29	2.03	1.90	33 60
Schumacher Stock Feed,	11.25	4.23	9.50	28 52
Clark's Superior Hen Food,	11.22	3.09	2.63	35 00
Chicago Alfalfa Horse and Mule Feed,	11.21	3.07	8.91	29 50
Anchor Chick Feed,	11.16	2.83	2.16	42 60
Chick Food Invigorator,	11.13	3.15	2.35	48 00
Sugarota Horse Feed,	11.08	3.93	15.55	29 00
Hominy feed,	11.02	8.04	3.94	28 56
C. O. and B. Feed,	10.97	4.20	9.69	28 50
A. No. 1 Poultry Grains,	10.94	3.52	2.97	35 00
Chicken Feed Scratch Size,	10.91	3.63	2.50	42 00
Sterling Feed,	10.90	3.62	7.59	27 13
American Hen Scratching Grains,	10.84	3.54	2.63	41 20
Peter's Arab Horse Feed,	10.78	3.22	8.66	31 13
Perfection Horse Feed,	10.74	2.96	8.46	32 60
John-Hen Poultry Feed,	10.72	3.29	2.94	39 60
Sterling Stock Feed,	10.69	4.38	7.71	25 33
Corn bran,	10.48	8.78	7.42	29 23
Diamond Scratch Feed (grit),	10.29	3.17	2.84	34 25
Corn and oat chops,	10.17	4.41	4.06	29 29
Monarch Chop Feed,	9.60	4.91	6.88	23 90
Pioneer Stock Feed,	9.58	3.83	8.74	30 67
Beet pulp,	9.30	1.35	17.97	26 79
Premium chop,	9.36	3.94	7.51	25 38
Park City Chop,	9.35	4.94	5.62	28 60
Victor Feed,	9.20	4.85	8.99	27 60
Yellow P. and S. Feed,	9.19	4.73	6.37	27 50
Boss Feed,	9.07	4.54	7.87	25 60
White Diamond Feed,	9.05	4.29	7.21	24 50
Corn, Oats and Barley Chop (The I. G. and M. Co.),	9.05	4.05	8.90	28 75
Corn chops,	9.04	4.23	1.88	30 60
Keystone Chop Feed,	8.97	4.12	5.07	30 60
Pioneer Horse and Cattle Feed,	8.79	3.48	8.64	33 50
C. O. B. K. Chop Feed (The T. G. & M. Co.),	8.60	3.72	6.21	31 60
M. D. Chop Feed (The T. G. & M. Co.),	8.58	4.37	6.76	27 00
C. O. and B. Chop Feed (The T. G. & M. Co.),	8.49	3.71	5.96	29 17
Class 5 (5 Per cent.-8 Per Cent. Protein).				
Corn flour,	7.94	4.37	1.32	32 00

DISCUSSION OF THE ANALYTICAL RESULTS.

In order that a few remarks may be made in regard to the results obtained on the feeding stuffs examined, a short discussion of several classes is included which follows in the order of classification given in Table III. A table is also included showing the number of samples, the average analysis and the retail price observed during the year, together with the data reported on the samples secured during a number of preceding years. The results of analyses and microscopical examinations, together with the analyses and composition guaranteed, will be found in Table VII, as indicated under each class.

OIL CAKE MEALS.

COTTONSEED MEAL.

Analyses on Pages 40 to 45.

Fifty-three samples of cottonseed meal were obtained, all of which were guaranteed. The content of crude protein ranged from 38.13 per cent. to 44.94 per cent., with an average of 41.19 per cent. The crude fat ranged from 6.68 per cent. to 11.90 per cent., with an average of 8.34 per cent. The crude fiber varied from 5.50 per cent. to 11.50 per cent., with an average of 8.65 per cent. Fourteen samples did not meet their guarantees for crude protein, which ranged from 38.50 per cent. to 41.00 per cent. It will be noted that some of the guarantees were given as "38.62 to 43.00 per cent.," "41.00 to 48.00 per cent.," "41.00 to 43.00 per cent.," etc., giving in such cases quite a range in the amount of crude protein which the meal might be found to contain. In seven cases where such a range in guarantees were given, the higher figure was reached, while in many cases where only one figure was guaranteed, the content of crude protein was found to be considerably in excess of the amount guaranteed. Two samples did not meet the guarantees for crude fat.

None of these samples were found to contain an excessive amount of cottonseed hulls which could be separated from the meal.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	1	9	11	24	34	47	53
Crude protein,	40.63	41.21	39.16	41.75	41.41	40.11	41.19
Crude fat,	7.09	9.09	9.55	8.79	8.69	8.18	8.34
Crude fiber,	--------	--------	10.16	8.39	8.15	8.73	8.65
Price per ton,	$28 00	$30 83	$31 90	$35 21	$32 51	$37 01	$33 98

LINSEED MEAL.

Analyses on Pages 44 to 51.

Fifty-nine samples of linseed meal were analyzed during the year, two being new process meals, and the remaining number being old process meals. All of these samples were found to be guaranteed.

In the new process meals, the crude protein ranged from 36.44 per cent. to 39.63 per cent., with an average of 37.50 per cent.; the crude fat ranged from 1.85 per cent. to 2.85 per cent., with an average of 2.38 per cent. and the crude fiber varied from 8.27 per cent. to 9.52 per cent., with an average of 8.74 per cent. Following is a table for new process oil meals.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	2	4	2	3	5	2	4
Crude protein,	36.27	35.86	36.59	34.32	39.47	36.10	37.50
Crude fat,	2.76	3.06	2.94	3.75	3.14	2.53	2.38
Crude fiber,	--------	--------	7.93	8.85	8.58	8.99	8.74
Price per ton,	$30 50	$30 52	$33 00	$33 00	$34 20	$38 50	$41 50

In the old process meals, the crude protein was found to range from 28.25 per cent. to 39.75 per cent., with an average of 35.31 per cent.; the crude fat varied from 5.25 per cent. to 9.68 per cent., with an average of 6.46 per cent. and the crude fiber ranged from 6.30 per cent. to 10.02 per cent., with an average of 8.17 per cent. In five cases the content of crude protein fell below their guarantees and in only one case was the content of crude fat less than the amount claimed.

Three samples of meal were received which were classed as "Linseed Meal with Admixtures" for the reason that they were made from unscreened flaxseed which contained a considerable proportion of weed seeds. These samples were guaranteed to contain at least 25.00 per cent. of crude protein, 8.00 per cent. of crude fat and not more than 11.00 per cent. of crude fiber, and upon analysis were found to comply with their guarantees. Following is a table for old process oil meals.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	10	4	23	62	41	62	55
Crude protein,	32.33	33.75	34.75	34.46	35.88	35.05	35.31
Crude fat,	7.12	7.26	7.23	6.94	6.90	6.67	6.46
Crude fiber,	--------	--------	8.17	8.19	7.80	7.94	8.17
Price per ton,	$38 10	$37 25	$36 57	$38 08	$38 32	$40 30	$41 72

CORN OIL MEAL.

Analyses on Pages 50 and 51.

One sample of feeding stuffs, sold as corn oil meal and so classified, was received, and upon analysis was found to contain 14.50 per cent. crude protein, 9.35 per cent. crude fat, and 5.95 per cent. of crude fiber. This sample was guaranteed to contain 16.00 per cent. of crude protein.

DISTILLERY AND BREWERY BY-PRODUCTS.

DISTILLERS' GRAINS.

Analyses on Pages 50 to 53.

During the year, 21 samples of distillers' grains were received and analyzed, all of which were found to be guaranteed. Seventeen were distillers' grains of which corn was the predominating grain represented and four were distillers' grains largely from rye.

In the distillers' grains from corn, the lowest crude protein was found to be 25.32 per cent., the highest 33.31 per cent., with an average of 29.87 per cent. The crude fat ranged from 10.10 per cent. to 16.62 per cent., with an average of 13.47 per cent. The crude fiber ranged from 7.80 per cent. to 12.95 per cent., with an average of 11.16 per cent. In three samples the content of crude protein fell below their guarantees. Following is a table for distillers' grains largely from corn.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	4	4	8	3	11	18	17
Crude protein,	31.19	30.94	28.73	33.69	29.64	29.56	29.87
Crude fat,	13.08	13.04	11.76	15.24	13.14	12.64	13.47
Crude fiber,	--------	--------	11.13	12.17	10.87	11.36	11.16
Price per ton,	$26 66	$27 25	$30 00	$30 00	$36 18	$33 76	$30 76

In the distillers' grains from rye, the following analyses were found: Lowest crude protein 16.69 per cent., highest 20.31 per cent., with an average of 18.14 per cent. The lowest crude fat, 6.95 per cent., highest, 12.50 per cent., with an average of 9.70 per cent. Lowest crude fiber, 11.95 per cent., highest, 15.60 per cent., with an average of 13.23 per cent. Following is a table for distillers' grains from rye.

AVERAGE ANALYSES AND RETAIL PRICES.

	1909.	1910.	1911.
Number of samples,	3	3	4
Crude protein,	15.96	22.26	18.14
Crude fat,	9.84	8.50	9.70
Crude fiber,	15.38	14.43	13.23
Price per ton,	$28 00	$27 67	$30 25

BREWERS' GRAINS.

Analyses on Pages 52 to 55.

Twenty-five sampels of brewers' grains were received, four of which were not properly guaranteed. The crude protein ranged from 24.50 per cent. to 33.44 per cent., with an average of 27.82 per cent. The crude fat ranged from 6.50 per cent. to 8.50 per cent., with an average of 7.59 per cent. The crude fiber varied from 10.87 per cent. to 16.05 per cent., with an average of 13.98 per cent.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	1	1	6	4	16	15	25
Crude protein,	28.50	22.50	26.34	28.19	27.21	25.53	27.82
Crude fat,	7.27	6.93	7.30	7.43	7.27	7.34	7.59
Crude fiber,	--------	--------	13.25	14.13	14.41	13.88	13.98
Price per ton,	$20 00	$23 00	$22 80	$28 25	$27 53	$27 53	$26 24

MALT SPROUTS.

Analyses on Pages 54 to 57.

Seven guaranteed samples of malt sprouts were analyzed. One of these samples was found to contain a considerable amount of barley hulls and chaff and a small amount of weed seeds, and one contained a considerable proportion of bindweed. The crude protein ranged from 23.50 per cent. to 28.56 per cent., with an average of 25.50 per cent. The crude fat ranged from 2.65 per cent. to 3.75 per cent., with an average of 3.04 per cent.. and the crude fiber ranged from 11.87 per cent. to 14.72 per cent., with an average of 12.07 per cent.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	1	5	6	4	17	8	7
Crude protein,	25.13	25.49	26.06	25.03	27.35	25.99	25.50
Crude fat,	1.53	2.12	2.04	1.93	2.07	2.00	3.04
Crude fibre,			12.33	13.15	12.92	12.71	12.07
Price per ton,	$20 00	$19 60	$24 75	$25 75	$26 21	$25 50	$26 21

MAIZE BY-PRODUCTS.

GLUTEN FEED.

Analyses on Pages 56 to 61.

The number of samples of gluten feed received during the year was 44, one of which was not guaranteed. Seven samples were artificially colored with aniline. We have been advised by manufacturers of gluten feed, who formerly used this color, that this practice has been discontinued. The addition of the "steep water," however, is being continued which causes the content of crude protein to be somewhat higher than the amount which would be present were the steep water not used, and also to cause a slight acidity to be present, which is due to the acid phosphates and acid organic compounds.

The crude protein ranged from 19.00 per cent. to 29.38 per cent., with an average of 25.13 per cent. The crude fat ranged from 2.35 per cent. to 6.68 per cent., with an average of 3.96 per cent. The crude fiber ranged from 5.32 per cent. to 8.05 per cent., with an average of 6.71 per cent.

Five samples were found to run under their guarantees in both crude protein and fat, three were low in crude protein alone, and two were low in crude fat alone.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	7	12	25	35	62	55	44
Crude protein,	23.76	25.04	24.37	24.14	25.43	23.84	25.13
Crude fat,	3.52	3.86	3.80	4.69	3.81	4.26	3.96
Curde fiber.	--------	--------	7.21	7.21	7.27	6.75	6.71
Price per ton,	$25 50	$25 61	$30 27	$31 09	$31 61	$30 69	$28 43

HOMINY FEED.

Analyses on Pages 60 to 63.

During the year, 26 samples of hominy feed were received, which were guaranteed. Only one was found to be less in crude protein than that guaranteed, and three were low in crude fat.

The crude protein ranged from 9.88 per cent. to 12.81 per cent., with an average of 11.02 per cent. The crude fat ranged from 6.75 per cent. to 9.70 per cent., with an average of 8.04 per cent. and the crude fiber ranged from 1.87 per cent. to 5.55 per cent., with an average of 3.94 per cent.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	1	6	10	18	32	49	26
Crude protein,	10.44	10.73	10.13	9.84	10.99	10.49	11.02
Crude fat,	8.55	8.92	7.95	7.99	8.73	8.78	8.04
Crude fiber,	--------	--------	5.08	4.12	4.75	3.98	3.94
Price per ton,	$26 00	$22 50	$31 22	$30 50	$31 31	$28 29	$28 56

CORN BRAN.

Analyses on Pages 62 to 65.

Thirteen guaranteed samples of feeding stuffs were received which were classed as corn bran. These samples were of a good, clean character, and no deficiencies were observed.

The crude protein averaged from 9.13 per cent. to 12.00 per cent., with an average of 10.48 per cent. The crude fat ran from 3.45 per cent. to 12.22 per cent., with an average of 8.78 per cent. and the crude fiber ran from 3.55 per cent. to 11.05 per cent., with an average of 7.42 per cent.

CORN FLOUR.

Analyses on Pages 64 and 65.

Only one sample of corn flour was received. This product was guaranteed to contain 9 per cent. of crude protein, 6 per cent. of crude fat and 2 per cent. of crude fiber. The analysis showed it to contain 7.94 per cent. of crude protein, 4.37 per cent. of crude fat, and 1.32 per cent. of crude fiber.

WHEAT OFFALS.

The number of samples of feeding stuffs received during the year which were classed as wheat offals was 151. This number was considerably less than the number examined during 1910. This class of feeding stuffs as a rule are free from adulterations and, therefore, it was deemed advisable not to go to the expense of analyzing such a large number as were secured last year. Of the number received 7 were low grade flours, 59 were middlings, 5 wheat middlings with admixtures, 4 mixed feeds and 76 were wheat bran. Except in the case of wheat middlings with admixtures the law does not require the guaranteed analysis to be given, however, in the majority of cases guarantees were furnished.

LOW GRADE FLOUR.

Analyses on Pages 64 and 65.

Seven samples of low grade flour were received, 4 being guaranteed. The crude protein ranged from 17.56 per cent. to 19.75 per cent., with an average of 18.54 per cent. The crude fat ranged from 3.90 per cent. to 5.08 per cent., with an average of 4.41 per cent., and the crude fiber ranged from 0.82 per cent. to 3.15 per cent., with an average of 2.27 per cent.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	7	3	15	24	18	24	7
Crude protein,	15.51	14.38	17.07	17.41	17.18	17.36	18.54
Crude fat,	3.61	3.03	4.44	4.54	5.11	4.53	4.41
Crude fiber,	--------	--------	2.32	2.53	4.88	2.40	2.27
Price per ton,	$29 86	$25 66	$33 96	$33 60	$33 11	$33 71	$34 43

WHEAT MIDDLINGS.

Analyses on Pages 64 to 69.

Fifty-nine samples of wheat middlings were obtained, 28 of which were guaranteed. Of the number guaranteed, 2 were low in both crude protein and fat, and 2 were low in fat alone. With one exception where a small amount of flaxseed and weed seeds were found to be present, the middlings were of a good, clean character.

The crude protein ranged from 14.69 per cent. to 19.56 per cent., with an average of 17.43 per cent. The crude fat ranged from 3.13 per cent. to 6.35 per cent., with an average of 4.52 per cent., and the crude fiber ranged from 1.97 per cent. to 10.30 per cent., with an average of 4.86 per cent.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	49	26	87	162	173	193	59
Crude protein,	15.23	16.64	17.17	16.75	16.93	17.35	17.43
Crude fat,	4.02	4.83	5.24	4.88	5.10	5.21	4.52
Crude fiber,	--------	--------	5.97	5.22	5.38	5.64	4.86
Price per ton,	$26 22	$24 17	$31 14	$31 80	$31 43	$30 33	$30 98

WHEAT MIDDLINGS WITH ADMIXTURES.

Analyses on Pages 68 and 69.

Five samples of feeding stuffs classed as "Wheat Middlings with Admixtures" were received and analyzed, all of which were guaranteed. One sample was composed of wheat middlings, red dog flour and hominy feed. Three were mixtures of wheat middlings and corn meal and one was a by-product obtained in the process of the manufacture of tin plate and was wheat middlings to which palm oil had been added. No deficiencies in the contents of crude protein and crude fat were found in these samples.

MIXED FEED—WHEAT BY-PRODUCTS.

Analyses on Pages 68 to 71.

Four samples of wheat mixed feed composed of wheat bran and wheat middlings, were analyzed. They were properly guaranteed and no adulteration was detected.

The crude protein ranged from 15.50 per cent. to 17.63 per cent., with an average of 16.80 per cent. The crude fat ranged from 4.18 per cent. to 5.13 per cent., with an average of 4.79 per cent. and the crude fiber ranged from 5.30 per cent. to 7.32 per cent., with an average of 6.63 per cent.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	4	5	16	18	7	16	4
Crude protein,	13.99	15.74	16.19	16.55	16.39	16.85	16.80
Crude fat,	4.43	5.10	4.91	4.82	4.86	5.18	4.79
Crude fiber,	--------	--------	7.49	7.64	7.65	7.96	6.63
Price per ton,	$24 75	$24 80	$29 18	$30 72	$24 57	$28 81	$26 25

WHEAT BRAN.

Aanlyses on Pages 70 to 75.

Seventy-six samples of wheat bran, 51 of which were guaranteed, were received. No deficiencies were detected in crude protein, and in only one case the content of crude fat was less than the amount claimed. All of the samples were free from foreign substances and were of a good quality.

The crude protein ranged from 14.75 per cent. to 17.94 per cent., with an average of 16.41 per cent. The crude fat ranged from 4.10 per cent. to 6.33 per cent., with an average of 5.02 per cent. The crude fiber ranged from 4.72 per cent. to 11.75 per cent., with an average of 9. 22 per cent.

AVERAGE ANALYSES AND RETAIL PRICES.

	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of samples,	59	26	75	258	176	246	76
Crude protein,	14.30	14.85	15.74	15.57	15.78	16.37	16.41
Crude fat,	4.48	4.79	5.02	4.96	4.99	5.14	5.02
Crude fiber,	--------	--------	9.72	9.50	10.08	9.78	9.22
Price per ton,	$23 74	$22 44	$28 66	$29 25	$28 54	$27 66	$28 68

RYE OFFALS.

Analyses on Pages 74 to 77.

Four samples of rye offals were received, three being rye middlings, and one a rye mixed feed, all of which were guaranteed. Only one deficiency was found, that being where the content of crude fat was less than that claimed.

The average analysis of the rye middlings was as follows: crude protein 17.46 per cent., crude fat 3.32 per cent. and crude fiber 4.24 per cent.

The rye mixed feed analyzed 15.81 per cent. of crude protein, 3.75 per cent. of crude fat and 3.85 per cent. of crude fiber.

WHEAT AND RYE OFFALS.

Analyses on Pages 76 and 77.

Only two samples of this class of by-products were received, one being a mixture of wheat and rye middlings, which was guaranteed, and which analyzed 15.94 per cent. of crude protein, 4.05 per cent. of crude fat and 3.80 per cent. of crude fiber. The other sample was a mixture of rye bran, rye middlings, wheat bran and wheat middlings, and was found to contain 14.38 per cent. of crude protein, 2.65 per cent. of crude fat and 4.10 per cent. of crude fiber.

BUCKWHEAT OFFALS.

Analyses on Pages 76 and 77.

Three samples of this class of offals were received during the year, two of which were buckwheat middlings, the other being a sample which was guaranteed and classed as buckwheat feed.

The average analysis of the middlings was 27.94 per cent. of crude protein, 7.46 per cent. of crude fat and 3.61 per cent. of crude fiber.

The feed analyzed 14.94 per cent. of crude protein, 3.62 per cent. of crude fat and 19.67 per cent. of crude fiber. This class of by-products are required to be guaranteed, and in this case the contents of crude protein and crude fat were found to be somewhat less than the amount claimed.

ALFALFA MEAL.

Analyses on Pages 76 to 79.

Sixteen samples of alfalfa meal were received. Three of these samples were alfalfa meal to which syrup or molasses had been added. In the straight alfalfa meals, the crude protein ranged from 14.06 per cent. to 18.03 per cent., with an average of 14.86 per cent., the crude fat ranged from 1.63 per cent. to 4.00 per cent., with an average of 2.47 per cent. and the crude fiber ranged from 26.57 per cent. to 31.97 per cent., with an average of 29.53 per cent.

In the four samples of alfalfa meals mixed with molasses, the average analysis was found to be as follows: crude protein 14.06 per cent., crude fat 1.44 per cent. and crude fiber 14.83 per cent. All of these meals were found to be of good quality.

AVERAGE ANALYSES AND RETAIL PRICES.

	1908.	1909.	1910.	1911.
Number of samples,	11	10	25	13
Crude protein,	15.12	15.47	14.76	14.86
Crude fat,	2.36	2.62	2.35	2.47
Crude fiber,	32.68	27.66	29.99	29.53
Price per ton,	$28 60	$32 00	$29 00	$30 46

BEET PULP.

Analyses on Pages 78 and 79.

The number of samples of beet pulp received was 14, all of which were found to be properly guaranteed. No deficiencies in crude protein and crude fat were detected, and in no case was the content of crude fibre in excess of the amount guaranteed, which was 20 per cent., except one which was guaranteed 18 per cent. A few of the samples received contained beet molasses, as claimed.

The content of crude protein ranged from 8.63 per cent. to 10.44 per cent., with an average of 9.39 per cent. The crude fat ranged from 0.85 per cent. to 1.95 per cent., with an average of 1.35 per cent. and the crude fiber ranged from 12.55 per cent. to 19.85 per cent., with an average of 17.97 per cent.

AVERAGE ANALYSES AND RETAIL PRICES.

	1907.	1908.	1909.	1910.	1911.
Number of samples,	3	4	4	11	14
Crude protein,	8.90	9.56	9.63	8.94	9.39
Crude fat,	0.69	0.92	1.01	1.16	1.35
Crude fiber,	19.44	19.40	18.04	17.71	17.97
Price per ton,	$23 33	$24 75	$25 12	$25 87	$26 79

MIXED FEEDS: PROPRIETARY AND OTHERWISE.

During the year 538 samples of feeding stuffs were received which are grouped under the general heading "Mixed Feeds." Six subdivisions of this group have been made and the results are reported and discussed under the following headings:

Proprietary Dairy and Stock Feeds.
Proprietary Horse and Mule Feeds.
Calf Meals.
Miscellaneous Feeds.
Miscellaneous Chop Feeds.
Proprietary Poultry Foods.

PROPRIETARY DAIRY AND STOCK FEEDS.

Analyses on Pages 80 to 127.

The number of feeding stuffs of this class which were received was 237, all of which were guaranteed. One-half of this number, or 114, were molasses feeds, so named for the reason that they are composed of such by-products as ground grain screenings, oat hulls, oat middlings, oat clippings, flax pods and stalks, fortified with other by-products, such as, cottonseed meal, linseed meal, distillers' grains, brewers' grains, maize by-products and wheat offals and mixed with molasses.

A large proportion of the dairy and stock feeds, not molasses feeds, are made from by-products low in protein and high in fiberous material including cottonseed hulls, oat hulls, oat middlings, oat clippings and flax plant refuse, to which are added by-products rather high in crude protein.

It may be fairly stated that this class of feeding stuffs represented by the samples examined during the year were found to be of a better quality and much cleaner in their appearance than those examined last year. The number of samples which contained unground weed seeds, which formerly have been found present in large quantities, has been less, and in those samples where weed seeds were detected their presence was not in such large amounts as was the case in samples analyzed and reported in former bulletins. Several samples were received, however, which contained varying amounts of weed seeds, some of which were unground. These seeds were introduced with grain screenings, where used, which had not been properly cleaned and freed from undesirable seeds. The number of deficiencies in protein and fat observed in this class of feeding stuffs was less than in those received during 1910. Twenty samples were analyzed which showed the crude protein to be in excess of one per cent. below the guaranteed amounts, and in three samples the content of crude fat was one-half of one per cent. less than that claimed. Such by-products as rice hulls, peanut shucks and ground corn cobs were not detected. Where oat hulls, flax plant refuse and cottonseed hulls are used in compounding a mixed feed, the law restricts the content of crude fiber, which such a feed may contain, to nine per cent. In the samples of feeding stuffs where these by-products were used, except in the case of Quaker Dairy Molasses Feed and Daisy Dairy Feed, the violations have been few in number. In the two brands referred to, the content of crude fiber has continued to be considerably in excess of the amount permitted.

The manufacture of Daisy Dairy Feed, Boss Feed and Sterling Feed, formerly manufactured by the Great Western Cereal Company, are now being produced by the Quaker Oats Company, which absorbed the former concern. Seven samples of Boss Feed and eight samples of Sterling Feeds manufactured by the Great Western Cereal Co. are placed in the table under this firm's name and two samples of each were placed on the market by the Quaker Oats Company and so listed. The chemical analysis and composition of the Proprietary Dairy and Stock Feeds will be found in the table as indicated and among the brands received are included:

Acme Feed, Altoona Grain and Feed Co's Dairy Feed, Sucrene Dairy Feed, Sucrene Mixing Feed, Sucrene Quaker Feed, Sucrene Stock Feed, Ubiko Union Grains, Unicorn Dairy Ration, Chesbro's Stock Feed, White Cross Stock Feed, Duffee's Mixed Feed, Crystaloid Dairy Feed, Elba Cottonseed Feed, Empire Feed, Emporium Feed, Faramel Dairy Feed, Sugar Ring Feed, Holstein Feed, Boss Feed, Daisy Dairy Feed, Sterling Feed, Sterling Stock Feed, H. & S. Alfalfa Feed, Husted Molasses Feed, Mayflower Stock Feed, Imperial Feed Meal, International Dairy Feed, International Molasses Feed, International Special Molasses Feed, Kornfalfa Feed, Badger Dairy Feed, McMahn's Concentrated Protein Feed, Milk and Muscle Producer and Special Pig Grower, Sugarota Dairy Feed, Otto Weiss Alfalfa Oats Feed, Yellow P. & S. Feed, Pioneer Stock Feed, Pritts' Cow Feed, Blue Ribbon Dairy Feed, Buckeye Mixed Feed, C. O. & B. Feed, Quaker Dairy Molasses Feed, Schumacher Stock Feed, Victor Feed, White Diamond Feed, Boveta Brand Cottonseed Hulls and Meal Mixture, Southern Fiber Co's Cottonseed Feed Meal, Jersey Cow Feed, Ko-boss Dairy Feed, Prime Cottonseed Feed, and Royal Feed, Sugarine Dairy Feed, Star Feed, Camps' Wamba Feed, Hammond Dairy Feed and Molasses Corn Flakes.

PROPRIETARY HORSE AND MULE FEEDS.

Analyses on Pages 126 to 133.

Thirty-eight guaranteed samples of feeding stuffs were secured which may be classed as Proprietary Horse and Mule Feeds. These samples were found to be in a good, clean condition, only two being reported as containing a small amount of weed seeds. No deficiencies were found where the crude protein was one per cent. or more, or the crude fat one and one-half per cent. or more, less than the guarantees claimed. In three cases only did the analyses fall slightly below the amounts guaranteed.

The products used in the compounding of these feeding stuffs included corn, corn grits, ear corn, oats, barley, wheat, buckwheat, cottonseed meal, linseed meal, gluten feed, hominy feed, brewers' grains, malt sprouts, alfalfa, wheat middlings, wheat bran, rye middlings, oat middlings, oat hulls, oat clippings, corn siftings, flax plant refuse, molasses and salt. Their chemical analyses and composition will be found in the table. The following brands were included in this class:

Altoona Feed Mill's Horse Chop, Sucrene Alfalfa Horse and Mule Feed, Ubiko Horse and Stock Feed, E. D. Clarke's Horse Chop, Pioneer Horse and Cattle Feed, Faramel Horse and Cattle Feeds, Columbia Alfalfa Horse Feed, Husted Horse Feed, Klepser Bros.' Horse Chop, Badger Alfalfa Horse and Mule Feed, McMahan's Prepared Horse Feed, Sugarota Horse Feed, Perfection Horse Feed, Peter's Arab Horse Feed, Pritt's Horse Feed, Molac Horse Feed, Schumacher Special Horse Feed, Sherman's Excello Horse Feed, Chicago Alfalfa Horse and Mule Feed and Hammond Horse Feed.

CALF MEALS.

Analyses on Pages 132 and 133.

Ten samples of Calf Meal were received and analyzed, all of which were guaranteed for analysis and composition. Only one was deficient in both crude protein and crude fat, and two were a little low in the amount of crude protein alone. These products may be classed as high protein feeds. The lowest protein was 18.69 per cent. and the highest was 27.06 per cent., with an average of 23.13 per cent. The ingredients used in manufacturing these meals include cottonseed meal, linseed meal, Locust bean meal, wheat meat, oat meal, wheat flour, ground flaxseed, wheat, barley, malt, beans, lentils, dried milk and salt. Four brands of Calf Meal were represented as follows:

Blatchford's Calf Meal, Gregson's Calf Meal, Sugarota Calf Meal and Schumacher Calf Meal.

MISCELLANEOUS FEEDS.

Analyses on Pages 134 and 135.

Five samples were sent in by Special Agents which were grouped in this class. Only two of these were guaranteed. One sample sold as "Flax Flakes" was found to be ground flax screenings consisting for the most part of weed seeds. In addition to the brand noted, the following brands were included in this class:

Mixed Red Dog, a "Mixed Feed," one sample of Corn, Oat and Rye Middlings and one of Yellow Feed Meal.

MISCELLANEOUS CHOP FEEDS.

Analyses on Pages 134 to 145.

One hundred and eight samples classified as Miscellaneous Chop Feeds were received and analyzed. Many of these samples were composed of one or more grains which were whole or ground and which are not required to be labeled with the guaranteed analyses. Fifty-seven of these chop feeds, however, were guaranteed. This class included eight samples of corn chop averaging 9.04 per cent. of crude protein, 4.23 per cent. of crude fat and 1.88 per cent. of crude fiber; three samples of rye chops averaging 11.29 per cent. of crude protein, 2.03 per cent. of crude fat and 1.90 per cent. of crude fiber; 39 samples of corn and oat chops averaging 10.17 per cent. of crude protein, 4.41 per cent. of crude fat and 4.06 per cent. of crude fiber and 58 samples of chop feeds composed of two or more products. The ingredients in these feeds included cottonseed meal, wheat bran, wheat middlings, rye middlings, hominy feed, corn, oats, barley, wheat, rye, ear corn, corn screenings, grain screenings, oat shorts, oat middlings, oat hulls, oat clippings and salt.

PROPRIETARY POULTRY FOODS.

Analyses on Pages 146 to 169.

The number of samples of Proprietary Poultry Foods analyzed was 140, 118 of which were guaranteed. One sample was found to be deficient in both crude protein and crude fat, nine were deficient in crude protein alone and eight were deficient in crude fat alone. The ingredients used in compounding these poultry foods included:

Corn, oats, hulled oats, oat groats, oat meal, barley, buckwheat, rye, spelts, millet, rice, peas, hemp seed, flaxseed, canary seed, rape, pea meal, Kaffir corn, milo maize, sunflower seed, alfalfa, cottonseed meal, linseed meal, hominy feed, gluten feed, wheat bran, wheat middlings, beef scraps, dried fish, meat meal, bone, bone meal, wheat screenings, Hen-e-ta bone grit, marble grit, oyster shells, charcoal and salt.

In several samples weed seeds were found to be present in varying amounts which were undoubtedly introduced by the use of grain screenings from which the weed seeds had not been properly cleaned or separated. A product known as "Chicken Feed Wheat," which is a poor grade of wheat containing a large proportion of weed seeds, was found to have been used in some cases. The brands of Poultry Foods included in this group are as follows:

Acme Milling Co's Mixed Chick Feed, Aleeda Chicken Feed, Chicken Scratch Feed, Amco Hen Feed, Blended Hen Food, Chick Food Invigorator, B. & G.'s Dry Mash Food, Bolgiano's Square Deal Chick Food, Square Deal Chick Starter and Square Deal Poultry Food, Rex Brand Pigeon Food, F. P. Cassell & Son's Developing Chick Feed, High Grade Pigeon Feed and Standard Poultry Scratch Feed, Chesbro's Trojan Chick Feed and Trojan Scratch Feed, Chicken Feed Wheat, E. D. Clark's Superior Hen Food and Superior Chick Food, Mixture-Arrow Chick Food, Mixture-Arrow Egg Food, Dayton's Ideal Scratch Grains, Crescent Chick Feed with grit, Globe Scratch Feed with and without grit, Pine Tree Scratch Feed, Queen Poultry Mash, Dyer's Hen Feed, Eaker & Vermilya's Chick Food, Red Comb Meal Mash, Red Comb Poultry Feed, Elkland Milling Co's Hen Food, John W. Eshelman's Chick Feed, Hen Feed and

Pigeon Feed, Blue Ribbon Little Chick Food, Sterling Chick Feed, Sterling Scratch Feed, Anchor Chick Feed, Anchor Developing Feed, Imperial Chicken Feed, Husted Laying Mash, Husted Poultry Feed, John-Hen Poultry Feed, Kift Milling Co's Poultry Food, A No. 1 Poultry Grains, Ideal Hen Feed, L. & S. Hen Feed, Lindsey Milling Co's Poultry Feed, Martin's Chick Feed and Mixed Poultry Feed, Diamond Scratch Feed with and without grit, No. 1 Scratch Feed, Purity Poultry Mash, Acme Mash Feed, Sugarota Chick Feed, Sugarota Scratch Feed, C. H. Notter's Mixed Chicken Feed, The Park & Pollard Co's Dry Mash, Gritless Chick Food, Growing Feed, Red Ribbon Chick Food, Scratch Feed and Screened Scratch Feed, Pontz's Mash Feed, Prit's Dry Mash, Purina Chicken Chowder, Purina Mill Feeds, Chick Size, Pigeon Size and Scratch Size, American Hen Scratching Grains, Schumacher Little Chick Feed, American Poultry Feed, Schumacher Scratching Grains, Red Hen Scratch Feed, Premier Scratch Feed, Excello Poultry Grains, Government Mash, Snyder's Scratch Feed, Dry Mash for Poultry, Spratts' Chicgrain, Steimesch Mixed Feed Hen Size, Suco Hen Feed, Excelsior Chicken Feed, Victor Poultry Food, White Oak Chick Feed, White Oak Large Feed, and Yost's Chick Feed, Perfection Mash Feed and Life Saver Little Chick Food.

ANIMAL BY-PRODUCTS.

Analyses on Pages 168 and 169.

Seven samples of feeding stuffs classed as Animal By-Products were received during the year, all of which were guaranteed. Three of these were found to be in excess of one per cent. below the guaranteed amounts for crude protein. The material used in preparing these products consisted of varying grades of meat scraps, beef cracklings and bone. The brands received were as follows:

Three Medal Poultry Meal, Berg & Co's Poultry Meal, Darling's Pure Ground Beef Scraps for Poultry, Fritz Co's Ground Beef Scraps for Poultry, Model Milling Co's Beef Scraps, Syracuse Cooked Meat Scraps and Brehm's Beef Scraps.

CONDIMENTAL STOCK AND POULTRY FOODS.

Analyses on Pages 168 to 171.

Twelve samples of this class of feeding stuffs were received and analyzed, seven of which were found to be guaranteed for crude protein, crude fat, crude fiber and composition. This class of goods usually are composed of a feeding stuff as a base to which has been added some condimental or regulative product. The ingredients claimed to be used in the samples received included the following:

Corn, corn meal, oats, oat middlings, oat hulls, wheat, millet, alfalfa meal, wheat middlings, wheat bran, Kaffir corn, bone meal, dried beef and bone, linseed oil meal, cottonseed meal, gluten feed, crackers, juniper berries, elm bark, ginger, gentian, anise seed, foenugreek, ground blood, fennel seed, licorice root, starch, sulphur, ferrous sulphate, salt, pepper, emsom salt, iron oxide, charcoal and petrol.

The brands include the following:

Blue Grass Matchless Egg Maker, F. P. C. Chick Manna, F. P. C. High Grade Poultry Mash Food, F. P. C. Success Chickseat, Conkey's Laying Tonic, Little Giant Stock Food, Pratt's Conditioner for Horses and Cattle, Pratt's Egg Producer, Rust's Egg Producer and Premier Egg Food.

ANALYSES OF FEEDING STUFFS COLLECTED BY SPECIAL AGENTS.

In the following table (No. VII) is given the partial chemical analyses and the results of the microscopical examinations, together with the guaranteed analyses, certified compositions and retail prices of the official samples of feeding stuffs which were secured by Special Agents of the Department during 1911. These samples are classed in the table under the headings or groups as follows:

Oil Cake Meals, including cottonseed meal, new process and old process linseed meals, linseed meal with admixtures and corn oil meal.

Distillery and Brewery By-Products, including distillers' grains, brewers' grains and malt sprouts.

Maize By-Products, including gluten feed, hominy feed, corn bran and corn flour.

Wheat Offals, including low grade flour, wheat middlings, wheat middlings with admixtures, mixed feed:—wheat by-products and wheat bran.

Rye Offals, including rye middlings and rye mixed feed.

Wheat and Rye Offals, including wheat and rye bran and middlings.

Buckwheat Offals, including buckwheat middlings and feeds.

Alfalfa Meals.

Beet Pulp.

Mixed Feeds, including proprietary dairy and stock feeds, proprietary horse and mule feeds, calf meals, miscellaneous feeds, miscellaneous chop feeds and proprietary poultry foods.

Animal By-Products.

Condimental Stock and Poultry Foods.

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
	OIL CAKE MEALS.					
	Cottonseed Meal.					
				Per ct.	Per ct.	Per ct.
5666	Amco, American Milling Co., Chicago, Ill.	Sunbury, Kift Milling Co.,	464	7.71	40.06	41.00
5720	"Farmer" Brand Fancy Choice, The Bartlett Co., Jackson, Mich.	Elwood City, R. B. Curry,	518	7.38	38.69	41–43
5711	"Farmer" Brand Fancy Choice, The Bartlett Co., Jackson, Mich.	New Castle, Adolph Roth,	509	6.39	38.13	41–43
		Average,	--------	6.88	38.41	--------
5298	"Battle Brand," W. P. Battle & Co., Memphis, Tenn.	Lancaster, Sprecher & Ganss.	96	9.17	42.75	38.62–43
5977	"Dove Brand," F. W. Brode & Co., Memphis, Tenn.	Pittsburg, The I. W. Scott Co.	679	7.73	42.81	38.62
6054	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	Doylestown, Henry S. Beidler.	756	8.02	41.69	41.00
5651	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	Knoxville, Deerfield Milling Co.	449	8.45	41.06	41.00
5749	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	Brookville, Kline's Flour & Feed Mill.	531	8.28	41.06	41.00
6139	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	Elizabethtown, E. H. Lehman.	841	7.96	43.38	41.00
6133	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	Elizabethtown, A. W. Martin.	835	7.16	40.00	41.00
6084	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	West Point, L. W. Mattern.	786	6.50	42.69	41.00
5674	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	Milton, C. H. McMahan,	472	7.85	40.50	41.00
5635	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	Troy, Snediker & Mitchell,	433	7.68	42.31	41.00
5707	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	Indiana, J. M. Stewart & Co.	505	7.95	42.63	41.00
6046	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	Doylestown, J. W. Stilwagon & Son.	748	7.08	40.13	41.00
5757	"Owl Brand," High Grade, F. W. Brode & Co., Memphis, Tenn.	Wyalusing, Welles Mill Co.,	20	7.64	41.56	41.00
		Average,	--------	7.68	41.55	--------
6126	Owl Brand, Pure, F. W. Brode & Co., Memphis, Tenn.	Ambler, J. Watson Craft,	828	6.65	42.38	41–43
5894	Owl Brand, Pure, F. W. Brode & Co., Memphis, Tenn.	Oil City, Clyde D. Duffee,	631	9.14	43.00	41–43
5485	Owl Brand, Pure, F. W. Brode & Co., Memphis, Tenn.	Warren, T. N. Dunham,	283	6.28	42.63	41–43
5319	Owl Brand, Pure, F. W. Brode & Co., Memphis, Tenn.	Lititz, Elmer Eby,	117	7.30	40.63	41–43

FEEDING STUFFS COLLECTED IN 1911.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct. 8.00	Per ct. 8.00	Per ct. 10.05	Per ct. 10.00	$1 65	Cottonseed product, -----	As certified, ------------	5666
8.43	7–12	10.40	4–12	1 75	------------------------------	Cottonseed meal, ------	5720
11.90	7–12	9.07	4–12	35 00	------------------------------	Cottonseed meal, ------	5711
10.17	--------	9.73	--------	35 00			
7.73	6–8	7.40	10.00	32 50	------------------------------	Cottonseed meal, ------	5298
9.25	6.00	7.27	10.00	34 00	Decorticated cottonseed,--	As certified, ------------	5977
7.73	6.00	7.42	10.00	32 00	Decorticated cottonseed,--	As certified, ------------	6054
8.43	6.00	8.60	10.00	1 75	Decorticated cottonseed,--	As certified, ------------	5651
7.58	6.00	9.90	10.00	1 90	Decorticated cottonseed,--	As certified, ------------	5749
8.00	6.00	7.00	10.00	32 00	Decorticated cottonseed,--	As certified, ------------	6139
7.95	6.00	10.00	10.00	1 60	Decorticated cottonseed,--	As certified, ------------	6133
9.30	6.00	7.30	10.00	32 00	Decorticated cottonseed,--	As certified, ------------	6084
7.63	6.00	10.07	10.00	36 00	Decorticated cottonseed,--	As certified, ------------	5674
8.90	6.00	7.92	10.00	1 65	Fully decorticated cottonseed.	As certified, ------------	5635
10.15	6.00	7.85	10.00	2 10	Decorticated cottonseed,--	As certified, ------------	5707
9.23	6.00	7.62	10.00	34 00	Decorticated cottonseed,--	As certified, ------------	6046
8.40	6.00	7.30	10.00	30 00	Fully decorticated cottonseed.	As certified, ------------	5757
8.48	--------	8.27	--------	34 18			
10.35	6–8	8.55	10.00	1 85	Decorticated cottonseed,--	As certified, ------------	6126
9.00	6–8	7.02	10.00	1 80	Decorticated cottonseed,--	As certified, ------------	5894
8.65	6–8	7.20	10.00	34 00	Decorticated cottonseed,--	As certified, ------------	5485
7.08	6–8	10.17	10.00	34 25	Decorticated cottonseed,--	As certified. ------------	5319

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
5497	Owl Brand, Pure, F. W. Brode & Co., Memphis, Tenn.	St. Marys, Hall, Kaul & Hyde Co.	295	6.95	43.31	41–43
5430	Owl Brand, Pure, F. W. Brode & Co., Memphis, Tenn.	Coatesville, P. D. Handwork Co., Ltd.	228	8.89	38.31	41–43
5960	Owl Brand, Pure, F. W. Brode & Co., Memphis, Tenn.	Pennsburg, Hillegass & Krauss.	89	8.63	43.25	41–43
5309	Owl Brand, Pure, F. W. Brode & Co., Memphis, Tenn.	Manheim, The Lancaster County Farmers' Association, Inc.	107	6.03	43.44	41–43
5406	Owl Brand, Pure, F. W. Brode & Co., Memphis, Tenn.	Spring Forge, Menges Bros. & Stauffer.	204	6.89	42.63	41–43
5388	Owl Brand, Pure, F. W. Brode & Co., Memphis, Tenn.	York, H. H. Smyser,	186	7.35	42.13	41–43
		Average,		7.41	42.17	
5290	------ H. E. Bridges & Co., Memphis, Tenn.	Lancaster, John W. Eshelman.	88	8.00	39.38	41.00
5275	------ H. E. Bridges & Co., Memphis, Tenn.	Butler, H. J. Klingler & Co.	73	7.67	43.94	41.00
		Average,		7.83	41.66	
5639	Buckeye Prime, The Buckeye Cotton Oil Co., Cincinnati, Ohio.	Wellsboro, Equity Co.-Operative Exchange.	437	7.58	41.56	39–41
5520	Buckeye Prime, The Buckeye Cotton Oil Co., Cincinnati, Ohio.	Coudersport, Eulalia Mills,	318	6.95	41.13	39–41
6072	Buckeye Prime, The Buckeye Cotton Oil Co., Cincinnati, Ohio.	Lansdale, A. C. Godshall & Co., Inc.	774	6.90	39.00	38.5–41
6008	Buckeye Prime, The Buckeye Cotton Oil Co., Cincinnati, Ohio.	Linesville, Linesville Milling Co.	710	8.77	37.81	39–41
6070	Buckeye Prime, The Buckeye Cotton Oil Co., Cincinnati, Ohio.	Colmar, C. R. Rosenberger,	772	7.43	37.19	38.5–41
5550	Buckeye Prime, The Buckeye Cotton Oil Co., Cincinnati, Ohio.	Clearfield, Ross & Woods,	348	6.96	40.06	39–41
5734	Buckeye Prime, The Buckeye Cotton Oil Co., Cincinnati, Ohio.	Wysox, Smith & Waldo,	11	8.50	40.44	39–41
		Average,		7.58	39.60	
6058	Good Luck Brand, S. P. Davis, Little Rock, Ark.	Chalfont, F. D. Hartzel's Sons.	760	6.58	38.38	41–43
5936	"Dixie Brand," Humphrey's Godwin Co., Memphis, Tenn.	Erie, D. J. Carroll,	720	8.26	38.38	38.62–43
5834	"Dixie Brand," Humphrey's Godwin Co., Memphis, Tenn.	New Castle, Fisher & Mengle.	507	7.44	42.81	38.62–43
5709	"Dixie Brand," Humphrey's Godwin Co., Memphis, Tenn.	Greenville, Hecker & Reed,	571	7.46	41.00	38.62–43
5351	"Dixie Brand," Humphrey's Godwin Co., Memphis, Tenn.	Tionesta, C. A. Lanson,	652	7.61	41.88	38.62–43
6018	"Dixie Brand," Humphrey's Godwin Co., Memphis, Tenn.	Scottdale, J. E. Pritts,	149	5.94	41.50	38.62–43

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat. Found.	Crude Fat. Guaranteed.	Crude Fiber. Found.	Crude Fiber. Guaranteed.	Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Per ct.	Per ct.	Per ct.	Per ct.				
8.08	6-8	7.60	10.00	$2 15	Decorticated cottonseed,	As certified,	5497
7.63	6-8	10.02	10.00	31 00	Decorticated cottonseed,	As certified,	5430
8.10	6-8	7.92	10.00	1 65	Fully decorticated cottonseed.	As certified,	5960
9.00	6-8	5.95	10.00	32 25	Decorticated cottonseed,	As certified,	5309
9.48	6-8	7.60	10.00	1 70	Decorticated cottonseed.	As certified,	5406
7.33	6-8	8.25	10.00	33 00	Decorticated cottonseed,	As certified,	5388
8.47	--------	8.02	--------	34 75			
9.30	9.00	8.22	9.00	30 50	Decorticated cottonseed,	As certified.	5290
9.28	9.00	5.60	9.00	1 65	Decorticated cottonseed,	As certified,	5275
9.29	--------	6.91	--------	31 75			
8.10	6.5-7	9.67	8-10	1 55	----------------------------	Cottonseed meal,	5639
8.23	6.5-7	7.85	8-10	1 75	----------------------------	Cottonseed meal,	5520
8.10	6.5-7	10.50	8-10	1 65	----------------------------	Cottonseed meal,	6072
6.68	6.5-7	10.80	8-10	1 65	----------------------------	Cottonseed meal,	6008
7.63	6.5-7	11.50	8-10	1 70	----------------------------	Cottonseed meal.	6070
7.75	6.5-7	10.35	8-10	2 00	----------------------------	Cottonseed meal,	5550
7.48	6.5-7	9.50	8-10	30 00	----------------------------	Cottonseed meal,	5734
7.71	--------	10.02	--------	33 71			
7.58	7-9	10.55	10.50	32 50	Decorticated cottonseed,	As certified.	6059
6.95	6-8	9.67	8-12	1 60	Pressed cottonseed,	As certified,	6018
7.85	6-8	7.85	8-12	30 00	Pressed cottonseed,	As certified,	5709
8.08	6-8	8.52	8-12	1 75	Made from pressed cottonseed.	As certified,	5834
8.28	6-8	8.77	6-12	1 75	Pressed cottonseed,	As certified,	5936
7.55	6-8	9.52	8-12	1 70	Made from pressed cottonseed.	As certified,	5351

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
5637	"Dixie Brand," Humphrey's Godwin Co., Memphis, Tenn.	Wellsboro, B. Schrader & Son.	435	7.25	41.25	38.62–43
5539	"Dixie Brand," Humphrey's Godwin Co., Memphis, Tenn.	Lock Haven, E. E. Wentz,	337	6.92	44.69	38.62–43
5500	"Dixie Brand," Humphrey's Godwin Co., Memphis, Tenn.	St. Marys, George Wolf, ---	298	6.84	38.88	38.62–43
		Average, -------------	--------	7.21	41.30	--------
5717	Choice, Kemper Mill and Elevator Co., Kansas City, Mo.	New Castle, Cascade Mills,	515	8.00	41.06	41.00
5542	Choice, Kemper Mill and Elevator Co., Kansas City, Mo.	Du Bois, A. T. Sprankle,--	340	6.92	42.63	41.00
		Average, -------------	--------	7.46	41.85	--------
6001	Sun Brand, J. Lindsay Wells Co., Mimphis, Tenn.	Turtle Creek, F. J. Riddle,	703	7.08	40.13	41–45
5493	Sun Brand, J. Lindsay Wells Co., Mimphis, Tenn.	St. Marys, L. Ritter, ------	291	6.50	40.63	41–45
		Average, -------------	--------	6.79	40.38	--------
5245	Golden Brand, Pure, F. E. Morse & Co., Little Rock, Ark.	Palmyra, The Londonderry Mills.	45	7.48	44.94	41.00
5232	Golden Brand, Pure, F. E. Morse & Co., Little Rock, Ark.	Palmyra, A. S. Stouffer,--	32	7.57	43.19	41.00
		Average, -------------	--------	7.52	44.07	--------
6098	"Bee Brand," W. C. Northern, Little Rock, Ark.	Hatfield, George S. Snyder Estate.	800	6.29	40.31	41-43
5258	Baltimore Brand, Prime, W. Newton Smith, Baltimore, Md.	Johnstown, Swope Bros.,--	58	6.80	40.69	38 62-43
5311	Bonita Brand, Southern Cotton Oil Co., Charlotte, N. C.	Manheim, F. K. Nauman,--	109	7.74	39.06	38.62–40
		Total average, -------	--------	7.44	41.19	--------
	Linseed Meal, N. P.					
6071	------ American Linseed Co., New York, N. Y.	Lansdale, A. C. Gotshall & Co., Inc.	773	10.09	37.25	36–40
6092	Pure Flax Meal, American Linseed Co., New York, N. Y.	West Point, Heebner & Kreible.	794	8.71	36.69	36–40
6089	Cleveland Flax Meal, American Linseed Co., New York, N. Y.	West Point, L. W. Mattern.	791	9.12	39.63	36–40
6102	Cleveland Flax Meal, American Linseed Co., New York, N. Y.	Hatfield, George S. Snyder Estate.	804	8.79	36.44	36–40
		Average, -------------	--------	9.17	37.50	------ --
	Linseed Meal, O. P.					
5607	------ American Linseed Co., New York, N. Y.	Williamsport, F. W. Dawson & Son.	405	8.60	38.94	32–36

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat. Found.	Crude Fat. Guaranteed.	Crude Fiber. Found.	Crude Fiber. Guaranteed.	Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Per ct.	Per ct.	Per ct.	Per ct.				
7.60	6–8	9.55	8–12	$1 60	Pressed cottonseed, ------	As certified, ------------	5637
9.10	6–8	5.50	8–12	1 75	Pressed cottonseed, ------	As certified, ------------	5539
7.20	6–8	10.72	8–12	1 60	Pressed cottonseed, ------	As certified, ------------	5500
7.83	--------	8.76	--------	33 13			
7.35	7.50	9.17	10.00	1 50	----------------------------	Cottonseed meal, ------	5717
9.00	7.50	7.80	10.00	1 75	----------------------------	Cottonseed meal, ------	5542
8.18	--------	8.48	--------	32 50			
9.23	7–8	9.20	9–10	1 95	Decorticated cottonseed,--	As certified, ------------	6001
9.18	7–8	8.65	9–10	1 60	Decorticated cottonseed,--	As certified, ------------	5493
9.21	--------	8.92	--------	35 50			
6.83	9.00	9.55	--------	34 00	Decorticated cottonseed,--	As certified, ------------	5245
6.71	9.00	9.92	--------	35 00	Decorticated cottonseed,--	As certified, ------------	5232
6.77	--------	9.73	--------	34 50			
9.38	7–9	7.82	10.50	34 00	Decorticated cottonseed,--	As certified, ------------	6098
10.05	7–9	7.60	10.50	34 00	----------------------------	Cottonseed meal, ------	5258
8.35	6.00	9.00	10.00	38 00	Made from cottonseed, --	As certified, ------------	5311
8.34	--------	8.65	--------	33 98			
2.85	1–3	8.72	6.75	42 00	----------------------------	New process oil meal, --	6071
1.85	1–3	8.45	9.5–11.5	41.00	----------------------------	New process oil meal, --	6092
2.13	1–3	8.27	9.5–11.5	41 00	----------------------------	New process oil meal, --	6089
2.68	1–3	9.52	9.5–11.5	42 00	----------------------------	New process oil meal, --	6102
2.38	--------	8.74	--------	41 50	----------------------------		
5.30	5–7	7.82	5.5–7	2 00	----------------------------	Linseed oil meal, ------	5607

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
5746	------ American Linseed Co., New York, N. Y.	Reynoldsville, Fales Grocery Co.	528	9.41	38.94	32-36
5464	Ground Linseed Cake, American Linseed Co., New York, N. Y.	Kittanning, J. A. Gault Co.	262	8.84	37.56	32-34
5725	------ American Linseed Co., New York, N. Y.	Towanda, F. H. Hagerman.	2	9.63	38.56	32-36
6093	------ American Linseed Co., New York, N. Y.	West Point, Heebner & Krieble.	795	10.37	36.69	34.00
5668	------ American Linseed Co., New York, N. Y.	Sunbury, Kift Milling Co.,	466	10.15	34.25	32-36
6157	------ American Linseed Co., New York, N. Y.	Lewistown, Lewistown Ice and Storage Co.	859	8.52	38.06	32-36
6087	------ American Linseed Co., New York, N. Y.	West Point, L. W. Mattern, New York, N. Y.	789	10.00	36.56	34.00
6145	------ American Linseed Co., New York, N. Y.	Rohrerstown, Miller & Bushong.	847	10.41	36.31	34.00
5377	------ American Linseed Co., New York, N. Y.	Charleroi, R. C. Mountser,	175	9.37	39.75	32-36
5985	------ American Linseed Co., New York, N. Y.	Derry, J. O. Nicely, ------	687	9.12	37.19	32-36
5551	------ American Linseed Co., New York, N. Y.	Clearfield, Ross & Woods,	349	8.15	39.06	32-36
5694	------ American Linseed Co., New York, N. Y.	Blairsville, Smith & McKelvey.	492	8.85	38.88	32-36
5236	------ American Linseed Co., New York, N. Y.	Palmyra, A. S. Stauffer, --	36	8.57	39.69	32-36
5502	------ American Linseed Co., New York, N. Y.	Kane, Swanson Grocery Co.	300	9.20	39.25	32-36
		Average, -------------	-------	9.27	37.98	--------
6150	Ground Oil Cake, Archer, Daniels Linseed Co., Minneapolis, Minn.	Quarryville, The Lancaster County Farmers' Association.	852	8.69	37.58	32.00
5268	E. I. Bailey, Cleveland, Ohio.	Butler, The Leedom & Worrall Co.	66	9.65	32.06	32.00
6004	------ Chapin & Co., Milwaukee, Wis.	Meadville, Sherman Milling Co.	706	8.68	36.75	33.00
5369	"Pure," J. M. Frisch & Co., Baltimore, Md.	Uniontown, W. S. Smith, --	167	9.00	34.88	32-36
5940	------ Hauenstein & Co., Buffalo, N. Y.	Oil City, Magee Feed Co.,	656	8.36	36.44	30-37
5543	------ Hauenstein & Co., Buffalo, N. Y.	Du Bois, A. T. Sprankle,--	341	7.57	38.44	30-37
		Average, -------------	--------	7.96	37.44	--------
6188	------ Hirst & Begley, Linseed Co., Chicago, Ill.	Wilmerding, Routh & Co.,	890	7.76	37.38	34.00
5969	------ The Guy G. Major Co., Toledo, Ohio.	Manor, Hiram Altman & Son.	671	9.40	30.69	30-36
6053	------ The Guy G. Major Co., Toledo, Ohio.	Doylestown, Henry S. Beidler.	755	8.66	29.50	30-36
5905	------ The Guy G. Major Co., Toledo, Ohio.	Berwick, T. M. Bomboy, --	67	9.04	30.50	30-36
5523	------ The Guy G. Major Co., Toledo, Ohio.	Coudersport, Gates Bros.,	321	8.63	28.25	30-36
6061	------ The Guy G. Major Co., Toledo, Ohio.	Chalfont, F. D. Hartzel's Sons.	763	7.94	32.19	30-36
6161	------ The Guy G. Major Co., Toledo, Ohio.	Lewistown, H. C. Jackson,	863	8.85	34.00	30-36
5276	------ The Guy G. Major Co., Toledo, Ohio.	Butler, H. J. Klingler & Co.	74	9.56	35.44	30-36
6011	------ The Guy G. Major Co., Toledo, Ohio.	Linesville, Linesville Milling Co.	713	8.26	31.75	30-36
6173	------ The Guy G. Major Co., Toledo, Ohio.	Mifflin, Manbeck, Nelson & Co.	875	9.16	33.00	30-36

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat. Found.	Crude Fat. Guaranteed.	Crude Fiber. Found.	Crude Fiber. Guaranteed.	Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Per ct.	Per ct.	Per ct.	Per ct.				
5.95	5–7	7.47	5.5–7	$2 10		Linseed oil meal,	5746
6.00	5–8	7.42	--------	2 00		Linseed oil meal,	5464
5.35	5–7	7.35	5.5–7	36 00		Linseed oil meal,	5725
5.43	5.00	7.95	8.00	42 00		Linseed oil meal,	6093
6.48	5–7	8.17	5.5–7	1 90		Linseed oil meal,	5668
6.15	5–7	8.10	5.5–7	2 40		Linseed oil meal,	6157
5.58	5.00	7.97	8.00	42 00		Linseed oil meal,	6087
5.90	5.00	8.32	8.00	41 50		Linseed oil meal,	6145
5.25	5–7	7.20	5.5–7	2 00		Linseed oil meal,	5377
6.33	5–7	7.70	5.5–7	2 75		Linseed oil meal,	5985
5.93	5–7	6.55	5.5–7	2 25		Linseed oil meal,	5551
5.80	5–7	7.15	5.5–7	2 00		Linseed oil meal,	5694
5.90	5–7	7.32	5.5–7	40 00		Linseed oil meal,	5236
5.30	5–7	7.30	5.5–7	2 00		Linseed oil meal,	5502
5.78	--------	7.58	--------	41 70			
7.03	6.00	7.92	10.00	41 00		Linseed oil meal,	6150
6.17	8.00	8.50	8.00	38 00		Linseed oil meal,	5268
6.50	5–7	7.25	7–10	42 00		Linseed oil meal,	6004
5.93	5–7	8.00	5–7	2 50		Linseed oil meal,	5369
6.90	5–7	8.47	6–10	40 00		Linseed oil meal,	5940
8.98	5–7	8.10	6–10	1 65	Made from kiln dried seed.	As certified,	5543
7.94	--------	8.29	--------	36 50			
9.68	8.00	6.30	9.00	2 00		Linseed oil meal,	6188
6.56	5–7	10.02	2–10	2 00		Linseed oil meal,	5969
6.58	5–7	9.67	2–10	42 00		Linseed oil meal,	6053
5.65	5–7	9.20	2–10	2 00		Linseed oil meal,	5905
7.10	5–7	8.70	2–10	2 00		Linseed oil meal,	5523
5.78	5–7	9.27	2–10	42 00		Linseed oil meal,	6061
6.65	5–7	9.42	2–10	2 50		Linseed oil meal,	6161
6.08	5–7	8.15	2–10	1 90		Linseed oil meal,	5270
6.58	5–7	8.87	2–10	1 85		Linseed oil meal,	6011
6.75	5–7	9.27	2–10	2 20		Linseed oil meal,	6173

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5716	------ The Guy G. Major Co., Toledo, Ohio.	New Castle, P. Wagner & Son.	514	9.03	29.31	30-36
		Average, -------------	--------	8.85	31.46	--------
5901	------ The Mann Bros. Co., Buffalo, N. Y.	Bloomsburg, R. R. Ikler,--	63	8.08	36.44	34–37
5247	"Pure," The Mann Bros. Co., Buffalo, N. Y.	Palmyra, The Londonderry Mills.	47	8.91	38.38	34–37
		Average, -------------	--------	8.49	37.41	--------
5395	------ The Metzger Seed and Oil Co., Toledo, Ohio.	York, Anderson Bros. Co.,	193	8.94	34.31	30–36
5895	------ The Metzger Seed and Oil Co., Toledo, Ohio.	Oil City, Clyde D. Duffee,	632	8.26	31.56	30-36
5486	------ The Metzger Seed and Oil Co., Toledo, Ohio.	Warren, T. N. Dunham, --	284	10.11	34.25	30–36
5787	------ The Metzger Seed and Oil Co., Toledo, Ohio.	Somerset, John G. Emert,	557	8.72	33.94	30–36
6073	------ The Metzger Seed and Oil Co., Toledo, Ohio.	Lansdale, A. C. Godshall & Co., Inc.	775	7.84	32.38	30-36
5443	------ The Metzger Seed and Oil Co., Toledo, Ohio.	New Brighton, J. H. Hornby & Sons.	241	8.27	36.00	30–36
5946	------ The Metzger Seed and Oil Co., Toledo, Ohio.	Franklin, Johnson & Co.,	662	8.95	32.63	30-36
5748	------ The Metzger Seed and Oil Co., Toledo, Ohio.	Brookville, Kline's Flour and Feed Mill.	530	8.38	29.44	30–36
5840	------ The Metzger Seed and Oil Co., Toledo, Ohio.	Sharon, J. M. Porter, ----	577	8.60	37.69	30–36
		Average, -------------	--------	8.67	33.58	--------
5264	------ Midland Linseed Co., Minneapolis, Minn.	Zelienople, Fred Zehner, --	62	10.10	37.25	32.00
5947	------ National Lead and Oil Co., Pittsburg, Pa.	Franklin, J. H. Lavery, ---	663	8.01	36.06	32.00
5862	------ Red Wing Linseed Co., Red Wing, Minn.	Canonsburg, Canonsburg Milling Co.	599	8.14	35.50	30.00
6029	------ The Sherwin-Williams Co., Cleveland, Ohio.	Erie, W. J. Carroll, ------	731	9.50	38.38	33.00
6169	------ The Sherwin-Williams Co., Cleveland, Ohio.	McVeytown, John T. Rodgers.	871	9.40	38.13	33.00
		Average, -------------	--------	9.45	38.26	--------
5499	------ Spencer Milling Co., Minneapolis, Minn.	St. Marys, Hall Kaul & Hyde Co.	297	8.98	36.25	32–38
5344	------ Thompson & Co., Allegheny, Pa.	Mt. Pleasant, J. H. Brown & Son.	142	8.90	33.69	32–37.5
5848	------ Thompson & Co., Allegheny, Pa.	Washington, D. P. Hart,--	585	8.54	28.44	32–37.5
5356	------ Thompson & Co., Allegheny, Pa.	Uniontown, King Bros., --	154	9.23	36.25	32–37.5
5774	------ Thompson & Co., Allegheny, Pa.	Altoona, Martin & Co., --	544	7.58	35.81	32–37.5
6200	------ Thompson & Co., Allegheny, Pa.	Pittsburg, Daniel McCaffrey's Sons Co.	902	9.94	35.44	32–37.5
5697	------ Thompson & Co., Allegheny, Pa.	Blairsville, George J. New,	495	7.98	35.75	32–37.5
		Average, -------------	--------	8.69	34.23	--------
		Total average, -------	--------	8.88	35.31	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
5.95	5–7	9.60	2–10	$1 90		Linseed oil meal,	5716
6.36		9.21		41 00			
7.70	6–7	8.50	5–10	2 00		Linseed oil meal,	5901
6.78	6–7	7.52	5–10	2 00		Linseed oil meal,	5247
7.24		8.01		40 00			
6.45	5–7	7.60	2–10	2 00		Linseed oil meal,	5395
6.85	5–7	9.67	2–10	2 00		Linseed oil meal,	5895
6.18	5–7	8.25	2–10	42 00		Linseed oil meal,	5486
6.23	5–7	8.40	2–10	2 00		Linseed oil meal,	5787
6.55	5–7	8.72	2–10	42 00		Linseed oil meal,	6073
6.73	5–7	7.52	2–10	1 80		Linseed oil meal,	5443
6.60	5–7	8.67	2–10	2 25		Linseed oil meal,	5946
7.33	5–7	9.00	2–10	2 00		Linseed oil meal,	5748
5.95	5–7	8.35	2–10	1 80		Linseed oil meal,	5840
6.54		8.46		40 11			
6.55	6.00	7.12	8.50	40 00		Linseed oil meal,	5264
7.33	5.20	8.45	8.90	2 25		Linseed oil meal,	5947
7.53	6.00	7.10	9.00	39 00		Linseed oil meal,	5862
6.18	6.00	7.45	8.00	2 10		Linseed oil meal,	6029
6.50	6.00	9.10	8.00	2 35		Linseed oil meal,	6169
6.34		8.27		44 50			
6.55	6–8	7.95	9–11	2 50		Linseed oil meal,	5499
6.10	5.5–8.5	8.85	6–11	2 25		Linseed oil meal,	5344
6.85	5.5–8.5	9.65	6–11	2 25		Linseed oil meal,	5848
7.50	5.5–8.5	7.35	6–11	2 25		Linseed oil meal,	5356
6.13	5.5–8.5	7.87	6–11	2 50		Linseed oil meal,	5774
6.53	5.5–8.5	8.15	6–11	42 00		Linseed oil meal,	6200
6.78	5.5–8.5	7.67	6–11	2 15		Linseed oil meal,	5697
6.65		8.25		45 00			
6.46		8.17		41 72			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
	Linseed Meal with Admixtures.					
5921	Old Process Laxo-Cake, Laxo-Cake Meal Co., Chicago, Ill.	Carnegie, C. A. Foster,	649	Per ct. 7.58	Per ct. 29.75	Per ct. 25–28
5471	Old Process Laxo-Cake, Laxo-Cake Meal Co., Chicago, Ill.	Parnassus, Johnston & Hamilton.	269	8.32	25.25	25–28
5915	Old Process Laxo-Cake, Laxo-Cake Meal Co., Chicago, Ill.	McKeesport, Keystone Commercial Co.	643	8.53	27.38	25–28
		Average,	--------	8.14	27.46	--------
	Corn Oil Meal.					
5398	Maizo, Chas. A. Krause Milling Co., Milwaukee, Wis.	York, F. Z. Stauffer,	196	6.60	14.50	16.00
	DISTILLERY & BREWERY BY-PRODUCTS.					
	Distillers' Grains.					
5287	Ajax Flakes, Ajax Milling and Feed Co., New York, N. Y.	Lancaster, John W. Eshelman.	85	6.15	31.31	30–33
5466	Ajax Flakes, Ajax Milling and Feed Co., New York, N. Y.	Kittanning, J. A. Gault Co.	264	5.73	31.94	30–33
5821	Ajax Flakes, Ajax Milling and Feed Co., New York, N. Y.	Mechanicsburg, A. B. Harnish.	50	5.88	28.88	27.00
6060	Ajax Flakes, Ajax Milling and Feed Co., New York, N. Y.	Chalfont, F. D. Hartzel's Sons.	762	5.54	32.31	30–33
6141	Ajax Flakes, Ajax Milling and Feed Co., New York, N. Y.	Elizabethtown, E. H. Lehman.	843	5.45	30.56	30–33
6115	Ajax Flakes, Ajax Milling and Feed Co., New York, N. Y.	Chester, T. Frank McCall,	817	6.77	30.00	30–33
6131	Ajax Flakes, Ajax Milling and Feed Co., New York, N. Y.	Elizabethtown, A. W. Martin.	833	6.14	29.69	25–33
5797	Ajax Flakes, Ajax Milling and Feed Co., New York, N. Y.	Leesport, J. A. Rieser,	33	6.32	30.50	30–33
5819	Ajax Flakes, Ajax Milling and Feed Co., New York, N. Y.	Newville, S. E. Shenk,	48	6.25	30.06	31–33

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
8.20	8-10	9.25	7-11	$40 00	Unscreened flaxseed from which the ordinary field weed seeds such as little buckwheat, foxtail, mustard, pigweed, rape, bind weed, etc., have not been separated and is thoroughly cooked and sterilized.	As certified, ------------	5921
8.73	8-10	9.57	7-11	38 00	Unscreened flaxseed from which the ordinary field weed seeds such as little buckwheat, foxtail, mustard, pigweed, rape, bind weed, etc., have not been separated and is thoroughly cooked and sterilized.	As certified, ------------	5471
8.15	8-10	9.67	7-11	2 50	Unscreened flaxseed from which the ordinary field weed seeds such as little buckwheat, foxtail, mustard, pigweed, rape, bind weed, etc., have not been separated and is thoroughly cooked and sterilized.	As certified, ------------	5915
8.36	--------	9.49	--------	42 67			
9.35	8.00	5.95	5.00	1 40	A pure corn product, ----	As certified, ------------	5398
15.05	11-14	12.15	12-14	31 00	----------------------------	Distillers' grains, (largely from corn).	5287
13.68	11-14	12.40	12-14	1 60	----------------------------	Distillers' grains (largely from corn).	5466
12.50	12-14	11.67	14.00	32 00	----------------------------	Distillers' grains (largely from corn).	5821
13.23	11.00	12.12	12-14	31 50	----------------------------	Distillers' grains (largely from corn).	6060
14.80	11-14	12.95	12-14	30 00	----------------------------	Distillers' grains (largely from corn).	6141
14.13	11-14	12.60	12-14	34 00	----------------------------	Distillers' grains (largely from corn).	6115
11.28	8-11	12.15	12-20	1 50	----------------------------	Distillers' grains (largely from corn).	6131
13.70	11-14	11.45	12-14	30 00	----------------------------	Distillers' grains (largely from corn).	5797
13.13	12.00	11.07	12-14	32 00	----------------------------	Distillers' grains (largely from corn).	5819

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6003	Ajax Flakes, Ajax Milling and Feed Co., New York, N. Y.	Meadville, Sherman Milling Co.	705	6.56	30.31	30-33
		Average, --------------	--------	6.07	30.56	--------
6026	Fourex Grains, The J. W. Biles Co., Cincinnati, Ohio.	Erie, A. P. Allen, ---------	728	4.89	33.31	31.00
5643	Fourex Grains, The J. W. Biles Co., Cincinnati, Ohio.	Wellsboro, George C. and F. A. Brooks.	441	8.74	31.63	31.00
		Average, --------------	--------	6.81	32.47	--------
5425	"Goodrich," The J. W. Biles Co., Cincinnati, Ohio.	Coatesville, P. D. Handwork Co., Ltd.	223	7.31	28.25	27-30
5640	Corn, Three "D," The Dewey Bros. Co., Blanchester, Ohio.	Wellsboro, Equity Co-Operative Exchange.	438	13.62	25.32	26-33
5456	Corn, Three "D," The Dewey Bros. Co., Blanchester, Ohio.	Apollo, L. Todd Owens, --	254	9.61	27.19	26-33
		Average, --------------	--------	11.61	26.26	--------
6031	"Hector's," The Hottelet Co., Milwaukee, Wis.	Corry, W. A. Dodd, ------	733	5.79	26.63	30-33
5629	"Husted," Husted Milling Co., Buffalo, N. Y.	Troy, H. M. Spalding & Son.	427	8.61	29.19	30-32
		Average, --------------	--------	7.20	27.91	--------
		Total average, -------	--------	7.02	29.87	--------
5457	Buckeye Gluten Feed, The Dewey Bros. Co., Blanchester, Ohio.	Apollo, L. Todd Owens, --	255	9.36	20.31	20.00
5271	Queen, Three "D," The Dewey Bros. Co., Blanchester, Ohio.	Slippery Rock, C. S. Schrubb.	69	5.71	17.94	18.36
5823	Highspire Feed, The Highspire Distillery Co., Ltd., Highspire, Pa.	Mechanicsburg, Miller & Eurich.	52	6.17	17.63	16.50
5681	Pure Rye, Thompson Distilling Co., West Brownsville, Pa.	Wilkinsburg, Johnston & Smith.	479	7.09	16.69	14.00
		Average, --------------	--------	7.08	18.14	--------
	Brewers' Grains.					
5736	------ Anheuser-Busch Brewing Association, St. Louis, Mo.	Ulster, O. F. Ayer, -------	13	7.76	26.75	22-28
5426	------ Anheuser-Busch Brewing Association, St. Louis, Mo.	Coatesville, P. D. Handwork Co., Ltd.	224	8.18	26.19	22-28
		Average, --------------	--------	7.97	26.47	--------
5420	------ Atlantic Export Co. of Wisconsin, Chicago, Ill.	West Chester, E. D. Hemphill.	218	5.88	33.25	25.00
6045	M. F. Baringer, Philadelphia, Pa.	Doylestown, J. W. Stilwagon & Son.	747	6.51	29.13	25.00
5633	"Midland," The J. W. Biles Co., Cincinnati, Ohio.	Troy, Snedeker & Mitchell,	431	6.99	27.06	23.00
5260	------ Conemaugh Brewing Co., Conemaugh, Pa.	Johnstown, Swope Bros.,--	60	4.75	28.56	22.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
13.95	11–14	11.90	12–14	$32 00	------------------------------	Distillers' grains (largely from corn).	6002
13.55	--------	12.04	--------	31 45			
15.18	12.00	9.90	13.00	32 00	Distillers' dried grains, --	Distillers' grains (largely from corn).	6026
13.10	12.00	11.87	13.00	28 50	Distillers' dried grains, --	Distillers' grains (largely from corn).	5643
14.14	--------	10.88	--------	30 25			
11.60	8–12	11.20	12–14	30 00	Distillers' dried grains, --	Distillers' grains (largely from corn).	5425
16.62	9–14	7.80	8–13	30 00	Distillers' dried grains, --	Distillers' grains (largely from corn).	5640
13.63	9–14	8.20	8–14	31 00	Distillers' dried grains, --	Distillers' grains (largely from corn).	5456
15.12	--------	8.00	--------	30 50			
10.10	10–12	9.80	14.00	32 00	------------------------------	Distillers' grains (largely from corn).	6031
13.25	8–10	10.50	9–11	1 25	------------------------------	Distillers grains (largely from corn).	5629
11.68	--------	10.15	--------	$28.50			
13.47	--------	11.16	--------	30 76			
6.95	5.00	12.12	15.00	26 00	------------------------------	Distillers' grains (largely from rye).	5457
9.93	4–9	15.60	8–15	1 50	Distillers' dried grains, --	Distillers' grains from rye.	5271
12.50	9.59	11.95	13.75	20 00	------------------------------	Distillers' grains from rye.	5823
9.43	7.00	13.27	14.00	1 25	Pure rye grains, ---------	As certified (small amount of barley residue present).	5681
9.70	--------	13.23	--------	30 25			
7.03	6–8	13.00	13–16	26 00	Steam dried brewers' grains.	As certified, -----------	5736
7.40	6–8	13.70	13–16	27 00	Steam dried brewers' grains.	As certified, -----------	5426
7.22	--------	13.35	--------	26 50			
7.35	6.00	13.32	15.00	24 00	Dried brewers' grains, ---	As certified, -----------	5420
7.98	6.00	13.00	15.00	27 00	------------------------------	Brewers' dried grains, --	6045
7.10	7.00	14.72	--------	1 25	------------------------------	Brewers' dried grains, --	5633
7.63	6.50	13.80	17.00	1 25	------------------------------	Brewers' dried grains, --	5260

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5419	Holstein, The Hottelet Co., Milwaukee, Wis.	West Chester, C. C. Hipple & Son.	217	4.06	26.75	25–27
5417	Holstein, The Hottelet Co., Milwaukee, Wis.	Kennet Square, W. H. Walker & Co.	215	4.90	25.69	25–27
		Average,		4.46	26.22	--------
5994	------ Independent Brewing Co. of Pittsburg, Pittsburg, Pa.	Braddock, Braddock Feed Co.	696	6.34	27.19	20.00
5254	------ Johnstown Dry Grains Co., Johnstown, Pa.	Johnstown, G. Bostert & Son.	54	5.16	28.88	24.00
6063	------ Wm. J. Lemp Brewing Co., St. Louis, Mo.	Chalfont, F. D. Hartzel's Sons.	765	6.69	33.44	--------
5995	------ Masontown Brewing Co., Masontown, Pa.	Braddock, Braddock Feed Co.	697	6.37	26.44	--------
5690	------ New Kensington Brewing Co., New Kensington, Pa.	Wilkinsburg, Wilkinsburg Milling Co.	488	8.49	26.69	--------
5680	"I. C. B.," Pittsburg Brewing Co., Pittsburg, Pa.	Wilkinsburg, Johnston & Smith.	478	7.74	26.38	25 00
5992	------ Pittsburg Brewing Co., Pittsburg, Pa.	Braddock, Marriott & Sons.	694	8.20	24.50	24-27
		Average,		7.97	25.44	--------
5798	Cas-Protein, Pottsville Feed Co., Pottsville, Pa.	Leesport, J. A. Rieser,	34	7.13	26.88	--------
6086	Durham, M. C. Rankin & Co., Milwaukee, Wis.	West Point, L. W. Mattern.	788	7.42	29.13	24–26
6052	"Pilsner," Rosekrans-Snyder Co., Philadelphia, Pa.	Doylestown, Henry S. Beidler.	754	5.75	28.88	25.00
5427	"Pilsner," Rosekrans-Snyder Co., Philadelphia, Pa.	Coatesville, P. D. Handwork Co., Ltd.	225	5.95	27.38	25.00
6096	"Pilsner," Rosekrans-Snyder Co., Philadelphia, Pa.	West Point, Heebner & Kriebel.	798	6.85	27.69	25.00
6105	"Pilsner," Rosekrans-Snyder Co., Philadelphia, Pa.	Hatfield, George S. Snyder Estate.	807	5.36	27.94	25.00
		Average,		5.97	27.97	--------
5432	"Schlitz Purity," Jos. Schlitz Brewing Co., Milwaukee, Wis.	Atglen, W. S. Hastings & Son.	230	6.48	28.44	26.00
6065	"Schlitz Purity," Jos. Schlitz Brewing Co., Milwaukee, Wis.	Colmar, C. R. Rosenberger,	767	6.85	27.00	26.00
		Average,		6.66	27.72	--------
5724	------ Stegmaier Brewing Co., Wilkes-Barre, Pa.	Towanda, F. H. Hagerman.	1	8.16	28.13	23.70
6124	"Pure," C. W. Wagar & Co., Philadelphia, Pa.	Ambler, J. Watson Craft,	826	6.10	27.06	24.00
		Total average,		6.56	27.82	--------
	Malt Sprouts.					
6064	------ M. F. Baringer, Philadelphia, Pa.	Chalfont, F. D. Hartzel's Sons.	766	7.46	24.25	25.00
6097	------ M. F. Baringer, Philadelphia, Pa.	West Point, Heebner & Kriebel.	799	7.38	28.56	25.00
6106	------ M. F. Baringer, Philadelphia, Pa.	Hatfield, George S. Snyder Estate.	808	7.45	26.94	25.00
		Average,		7.43	26.58	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
8.28	5-7	15.87	14-17	$25 00	Dried brewers' grains, ---	As certified, ------------	5419
7.50	5-7	16.05	14-17	26 50	Dried brewers' grains, ---	As certified, -----------	5417
7.89	--------	15.96	--------	25 75			
7.58	5.00	13.77	18.00	1 20	Made from malt, wheat and rice.	As certified, -----------	5904
7.60	6.71	14.70	15.66	1 30	--------------------------	Brewers' dried grains, --	5254
7.43	--------	10.87	--------	1 35	--------------------------	Brewers' dried grains, --	6063
7.90	--------	15.25	--------	1 20	--------------------------	Brewers' dried grains, --	5995
7.30	--------	13.47	--------	24 00	--------------------------	Brewers' dried grains, --	5690
8.00	7.50	13.95	14.00	1 50	--------------------------	Brewers' dried grains, --	5680
8.35	5.5-7.5	15.00	17.50	1 40	--------------------------	Brewers' dried grains, --	5992
8.18	--------	14.47	--------	29 00			
8.50	--------	16.05	--------	21 60	--------------------------	Brewers' dried grains, --	5798
6.80	6.00	14.12	16.00	27 00	--------------------------	Brewers' dried grains, --	6086
7.73	5.00	13.12	18.00	29 00	--------------------------	Brewers' dried grains, --	6052
7.65	5.00	12.72	18.00	27 00	Brewers' dried grains, ---	As certified, -----------	5427
7.25	5.00	12.35	18.00	28 00	--------------------------	Brewers' dried grains, --	6096
7.53	5.00	14.95	18.00	28 00	--------------------------	Brewers' dried grains, --	6105
7.54	--------	13.28	--------	28 00			
7.23	6.00	13.90	14.00	27 00	Dried grains, ------------	Brewers' dried grains, --	5432
6.50	6.00	14.37	14.00	28 00	--------------------------	Brewers' dried grains, --	6065
6.87	--------	14.14	--------	27 50			
7.78	6.30	12.15	16.25	23 00	--------------------------	Brewers' dried grains, --	5724
8.23	6.00	15.42	15.00	1 45	--------------------------	Brewers' dried grains, --	6124
7.59	--------	13.98	--------	26 24			
2.95	2.00	12.10	11.00	25 50	--------------------------	Malt sprouts, ----------	6064
3.10	1.60	11.92	13.00	26 00	--------------------------	Malt sprouts, ----------	6097
2.73	1.60	13.80	13.00	1 35	--------------------------	Malt sprouts, ----------	6106
2.93	--------	12.60	--------	26.17			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct	Per ct.
6024	------ Francis Duhne, Jr., Milwaukee, Wis.	Erie, A. P. Allen, ---------	726	7.49	24.44	25.00
6116	------ Francis Duhne, Jr., Milwaukee, Wis.	Chester, T. Frank McCall,	818	7.35	24.06	25.00
5802	------ Francis Duhne, Jr., Milwaukee, Wis.	Wernersville, George W. Wertz.	38	8.62	26.75	25.00
		Average, -------------	--------	7.82	25.08	--------
6028	------ Frazer-Smith Co., Minneapolis, Minn.	Erie, A. P. Allen, --------	730	6.43	23.50	20-25
		Total average, -------	--------	7.45	25.50	--------
	MAIZE BY-PRODUCTS.					
	Gluten Feed.					
5934	Cream of Corn, American Maize Products Co., Roby, Indiana.	South Bethlehem, C. C. Lynn & Co.	81	7.71	26.25	23-25
5553	Clinton, Clinton Sugar Refining Co., Clinton, Iowa.	Clearfield, J. W. Eberts,--	351	8.36	28.13	20-25
5507	Clinton, Clinton Sugar Refining Co., Clinton, Iowa.	Smethport, F. A. Green, --	305	8.44	22.25	20-25
5431	Clinton, Clinton Sugar Refining Co., Clinton, Iowa.	Atglen, W. S. Hastings & Son.	229	8.21	26.38	20-25
5930	Clinton, Clinton Sugar Refining Co., Clinton, Iowa.	Allentown, H. N. Schleifer,	77	9.51	26.19	20-25
6101	Clinton, Clinton Sugar Refining Co., Clinton, Iowa.	Hatfield, George S. Snyder Estate.	803	9.25	23.31	20-25
5233	Clinton, Clinton Sugar Refining Co., Clinton, Iowa.	Palmyra, A. S. Stauffer,	33	7.76	27.94	20-25
5324	Clinton, Clinton Sugar Refining Co., Clinton, Iowa.	Kinzer, E. E. and W. J. L. Walker.	122	9.02	26.19	20-25
6147	Clinton, Clinton Sugar Refining Co., Clinton, Iowa.	Quarryville, J. F. Weaver,	849	8.99	26.88	20-25
		Average, -------------	--------	8.69	25.91	--------
5864	Buffalo, Corn Products Refining Co., New York, N. Y.	Canonsburg, Canonsburg Milling Co.	601	8.51	28.44	23-25
6034	Buffalo, Corn Products Refining Co., New York, N. Y.	Corry, W. A. Dodd, ------	736	8.72	27.81	23-25
5627	Buffalo, Corn Products Refining Co., New York, N. Y.	Muncy, Eaker & Virmilya,	425	8.14	25.38	24-27
5294	Buffalo, Corn Products Refining Co., New York, N. Y.	Lancaster, John W. Eshelman.	92	8.36	25.75	24-27
5510	Buffalo, Corn Products Refining Co., New York, N. Y.	Bradford, L. A. Fischer & Co.	308	6.84	23.50	23-25
5762	Buffalo, Corn Products Refining Co., New York, N. Y.	Forest City, Forest City Milling and Supply Co.	25	9.29	26.81	23-25
5920	Buffalo, Corn Products Refining Co., New York, N. Y.	Carnegie, C. A. Foster, --	648	9.28	27.19	23-25
5428	Buffalo, Corn Products Refining Co., New York, N. Y.	Coatesville, P. D. Handwork Co., Ltd.	226	8.48	26.56	24-27
5703	Buffalo, Corn Products Refining Co., New York, N. Y.	Indiana, Hetrick & Wilson.	501	8.46	26.31	23-25

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.05	2.00	12.35	11.00	$26 00	----------	Malt sprouts, ----------	6024
3.05	2.00	13.77	11.00	27 00	----------	Malt sprouts, a large proportion of barley hulls and chaff and a small amount of weed seeds.	6116
3.75	2.00	11.87	11.00	25 00	----------	Malt sprouts and a considerable amount of bind weed.	5802
3.28	--------	12.66	--------	26 00			
2.65	1-3	14.72	5-30	27 00	----------	Malt sprouts, ----------	6028
3.04	--------	12.07	--------	26 21			
3.55	2.50	6.57	8.50	1 50	----------	Gluten feed, ----------	5934
4.63	3.00	7.40	7.50	1 50	----------	Gluten feed, ----------	5553
6.13	3.00	6.62	7.50	29 00	----------	Gluten feed, ----------	5507
4.88	3.00	7.30	8.00	27 00	----------	Gluten feed, ----------	5431
4.40	3.00	6.87	8.00	1 50	----------	Gluten feed, ----------	5930
3.50	3.00	6.07	7.50	1 50	----------	Gluten feed, ----------	6101
6.45	3.00	7.20	7.50	28 00	----------	Gluten feed, ----------	5233
6.68	3.00	7.00	7.50	28 50	----------	Gluten feed, ----------	5324
4.25	3.00	7.30	7.50	30 00	----------	Gluten feed, ----------	6147
5.12	--------	6.97	--------	29 06			
3.43	2.50	6.60	8.50	30 00	----------	Gluten feed, ----------	5864
3.18	2.50	6.57	8.50	31 00	----------	Gluten feed, ----------	6034
4.05	2.50	6.75	8.50	1 40	Colored with No. 85 orange I and No. 4 Napthol Yellow "S."	Gluten feed, colored, --	5627
3.28	2.50	6.15	8.50	26 75	----------	Gluten feed, colored, --	5294
3.90	2.50	8.05	8.50	1 45	----------	Gluten feed, ----------	5510
2.90	2.50	6.70	8.50	28 00	----------	Gluten feed, ----------	5762
3.80	2.50	6.30	8.50	30 00	----------	Gluten feed, ----------	5920
3.55	2.50	6.60	8.50	27 00	----------	Gluten feed, ----------	5428
2.35	2.50	6.95	8.50	28 00	----------	Gluten feed, ----------	5703

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5444	Buffalo, Corn Products Refining Co., New York, N. Y.	New Brighton, J. H. Hornby & Sons.	242	8.47	29.00	23–25
5838	Buffalo, Corn Products Refining Co., New York, N. Y.	Greenville, Mathers Bros.,	575	8.27	28.13	23–25
6146	Buffalo, Corn Products Refining Co., New York, N. Y.	Rohrerstown, Miller & Bushong.	848	10.03	29.38	23–25
5378	Buffalo, Corn Products Refining Co., New York, N. Y.	Charleroi, R. C. Mountser.	176	9.10	28.50	23–25
5316	Buffalo, Corn Products Refining Co., New York, N. Y.	Manheim, F. K. Nauman,	114	8.55	26.38	24–27
5262	Buffalo, Corn Products Refining Co., New York, N. Y.	New Providence, J. F. Weaver.	K 1	7.20	27.06	24–27
5263	Buffalo, Corn Products Refining Co., New York, N. Y.	New Providence, J. F. Weaver.	K 2	8.12	27.03	24–27
6022	Buffalo, Corn Products Refining Co., New York, N. Y.	Erie, Weddige Bros.,	724	8.32	27.88	23–25
5242	Buffalo, Corn Products Refining Co., New York, N. Y.	Prescott, Ephraim Zugg,	42	7.35	27.94	24–27
		Average,		8.41	27.17	
5932	Cedar Rapids, Douglas & Co., Cedar Rapids, Iowa.	Bethlehem, Diamond Roller Mills.	79	9.47	23.38	20–25
5726	Cedar Rapids, Douglas & Co., Cedar Rapids, Iowa.	Towanda, F. H. Hagerman.	3	8.56	21.13	22.00
5667	Cedar Rapids, Douglas & Co., Cedar Rapids, Iowa.	Sunbury, Kift Milling Co.,	465	7.40	19.00	22.00
6009	Cedar Rapids, Douglas & Co., Cedar Rapids, Iowa.	Linesville, Linesville Milling Co.	711	8.56	21.38	22.00
5721	Cedar Rapids, Douglas & Co., Cedar Rapids, Iowa.	Elwood City, J. P. Morison.	519	6.64	21.19	22.00
5839	Cedar Rapids, Douglas & Co., Cedar Rapids, Iowa.	Sharpsville, Wheeler & Mehler.	576	6.70	21.06	22.00
		Average,		7.88	21.19	
6142	Conestoga Choice Yellow, Jonas F. Eby & Son, Lancaster, Pa.	Elizabethtown, E. H. Lehman.	844	9.26	22.19	23.00
6130	Conestoga Choice Yellow, Jonas F. Eby & Son, Lancaster, Pa.	Elizabethtown, A. W. Martin.	832	10.54	23.25	20.00
		Average,		9.90	22.72	
5488	K. K. K., J. C. Hubinger Bros. Co., Keokuk, Iowa.	Warren, T. M. Dunham,	286	8.27	22.94	23.00
5622	K. K. K., J. C. Hubinger, Bros. Co., Keokuk, Iowa.	Williamsport, John T. Stahlnecker.	420	7.29	22.56	23.00
		Average,		7.78	22.75	
6095	Jenks, Huron Milling Co., Harbor Beach, Mich.	West Point, Heebner & Krieble.	797	9.56	23.00	23–25
6088	Jenks, Rosekrans-Snyder Co., Philadelphia, Pa.	West Point, L. W. Mattern.	790	9.16	23.69	23–25
		Average,		9.36	23.35	

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat. Found.	Crude Fat. Guaranteed.	Crude Fiber. Found.	Crude Fiber. Guaranteed.	Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Per ct. 3.43	Per ct. 2.50	Per ct. 7.05	Per ct. 8.50	$1 30	--------------------------	Gluten feed, ----------	5444
2.50	2.50	6.62	8.50	1 30	--------------------------	Gluten feed, ----------	5838
3.75	2.50	6.05	8.50	31 00	--------------------------	Gluten feed, ----------	6146
2.80	2.50	6.55	8.50	29 00	--------------------------	Gluten feed, ----------	5378
3.90	2.50	6.30	8.50	30 00	Colored with No. 85, Orange I and No. 4 Napthol Yellow "S."	Gluten feed, colored, --	5316
2.96	2.50	6.15	8.50	26 00	Colored with No. 85, Orange I and No. 4 Napthol Yellow "S."	Gluten feed, colored, --	5262
4.30	2.50	5.56	8.50	26 00	Colored with No. 85, Orange I and No. 4 Napthol Yellow "S."	Gluten feed, colored, --	5263
3.15	2.50	6.20	8.50	1 50	--------------------------	Gluten feed, ----------	6022
2.50	2.50	6.65	8.50	27 00	Colored with No. 85, Orange I and No. 4 Napthol Yellow "S."	Gluten feed, colored, --	5242
3.32	--------	6.54	--------	28 26			
4.15	3.00	7.75	8.00	1 50	--------------------------	Gluten feed, ----------	5932
2.67	4.00	6.55	8.00	25 50	--------------------------	Gluten feed, ----------	5726
5.03	4.00	7.25	8.00	1 40	--------------------------	Gluten feed, ----------	5667
2.67	4.00	5.32	8.00	1 50	--------------------------	Gluten feed, ----------	6009
2.90	4.00	6.32	8.00	1 40	--------------------------	Gluten feed, ----------	5721
2.99	4.00	6.47	8.00	1 45	--------------------------	Gluten feed, ----------	5839
3.40	--------	6.61	--------	28 41	--------------------------		
3.68	4.00	6.90	7.00	30 00	--------------------------	Gluten feed, ----------	6142
3.40	2.00	6.47	9.00	1 50	--------------------------	Gluten feed, ----------	6130
3.54	--------	6.68	--------	30 00			
5.47	2.00	6.75	7.00	30 00	Artificially colored with aniline.	Gluten feed, colored, --	5488
4.43	2.00	7.65	7.50	1 40	Artificially colored with aniline.	Gluten feed, colored, --	5622
4.95	--------	7.20	--------	29 00			
5.28	3.00	6.92	8 00	31 00	Colored with No. 4 Napthol Yellow S and No. 85 Orange.	Gluten feed, colored, --	6095
5.68	3.00	6.37	5.00	31 00	Colored with No. 4 Napthol Yellow S and No. 85 Orange.	Gluten feed, colored, --	6088
5.48	--------	6.64	--------	31 00			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6074	------ Keever Starch Co., Columbus, Ohio.	Lansdale, A. C. Godshall & Co., Inc.	776	7.03	20.44	--------
6127	Hoosier, Piel Bros. Starch Co., Indianapolis, Ind.	Ambler, J. Watson Craft,	829	8.24	25.31	14–16
5708	"P. Bros.," Piel Bros. Starch Co., Indianapolis, Ind.	New Castle, Fisher & Mengle.	506	8.83	24.50	21–23
5249	------ Piel Bros. Starch Co., Indianapolis, Ind.	Palmyra, The Londonderry Mills.	49	7.90	22.44	21–23
		Average, -------------	--------	8.36	23.47	--------
6069	"Cream of Corn," C. W. Wager & Co., Philadelphia, Pa.	Colmar, C. R. Rosenberger,	771	6.81	25.50	23–25
		Total average, ------	--------	8.38	25.13	--------
	Hominy Feed.					
5318	"Purity," American Rice and Cereal Co., Keokuk, Iowa.	Lititz, Elmer Eby, --------	116	8.00	10.63	10.00
5833	"Pearl," E. I. Bailey, Cleveland, Ohio.	Greenville, Hecker & Reid,	570	9.18	11.50	10.26
5315	------ M. F. Baringer, Philadelphia, Pa.	Manheim, F. K. Nauman,	113	11.14	11.00	9.00
6165	------ M. F. Baringer, Philadelphia, Pa.	McVeytown, John T. Rodgers.	867	8.55	11.31	9.00
6043	------ M. F. Baringer, Philadelphia, Pa.	Doylestown, J. W. Stilwagon & Son.	745	10.38	10.69	9.00
5800	------ M. F. Baringer, Philadelphia, Pa.	Womelsdorf, Womelsdorf Roller Mills.	36	9.67	10.81	9.00
5243	------ M. F. Baringer, Philadelphia, Pa.	Prescott, Ephraim Zug, --	43	11.49	9.88	9.00
		Average, -------------	--------	10.24	10.74	--------
5394	Evans, Evans Milling Co., Indianapolis, Ind.	York, Anderson Bros. Co.,	192	9.44	10.75	10.00
6172	Evans, Evans Milling Co., Indianapolis, Ind.	McVeytown, W. M. Atkinson.	874	10.70	10.50	10.00
6010	Evans, Evans Milling Co., Indianapolis, Ind.	Linesville, Linesville Milling Co.	712	9.00	10.94	10.00
5675	Evans, Evans Milling Co., Indianapolis, Ind.	Milton, C. H. Mahan, ---	473	9.30	10.75	10.00
		Average, -------------	--------	9.61	10.74	--------
5396	Badger, Chas. A. Kraus Milling Co., Milwaukee, Wis.	York, Anderson Bros. Co.,	194	9.88	10.81	10.00
5411	Badger, Chas. A. Krause Milling Co., Milwaukee, Wis.	West Grove, S. K. Chambers & Bro.	209	7.28	12.00	10.00
6132	Badger, Chas. A. Krause Milling Co., Milwaukee, Wis.	Elizabethtown, A. W. Martin.	834	9.84	11.69	9.00
5385	Balger, Chas. A. Krause Milling Co., Milwaukee, Wis.	York, H. H. Smyser, ----	183	8.23	10.75	9.00
5413	Badger, Chas. A. Krause Milling Co., Milwaukee, Wis.	Kennett Square, W. H. Walker & Co.	211	9.56	12.81	10.00
		Average, -------------	--------	8.95	11.61	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.73	--------	6.00	--------	$1.55	--------------------------	Gluten feed, ,------------	6074
4.63	2.00	7.47	8.00	1 65	Artificially colored occasionally with Orange No. 122.	Gluten feed, colored, --	6127
3.80	2.00	6.87	8.00	30 00	Artificially colored occasionally with Orange No. 122.	Gluten feed, colored, --	5708
4.90	2.00	7.00	8.00	28 00	Artificially colored occasionally with Orange No. 122.	Gluten feed, colored, --	5249
4.35	--------	6.93	--------	29 00			
3.45	2.50	7.10	8.50	1 55	--------------------------	Gluten feed, ------------	6069
3.96	--------	6.71	--------	28 43			
6.90	7.34	3.12	3.57	25 50	--------------------------	Hominy feed, ----------	5318
9.18	8.70	4.77	3.84	1 40	--------------------------	Hominy feed, ----------	5833
8.03	6.00	2.22	10.00	28 00	--------------------------	Hominy feed, ----------	5315
9.15	6.00	5.55	10.00	1 60	--------------------------	Hominy feed, ----------	6165
8.20	6.00	2.37	10.00	32 00	--------------------------	Hominy feed, ----------	6043
7.60	6.00	2.32	10.00	29 00		Hominy feed, ----------	5800
7.00	6.00	2.00	10.00	25 00	--------------------------	Hominy feed, ----------	5243
8.00	--------	2.89	--------	29 20			
9.70	8.00	4.82	7.00	1 35	Manufactured from white corn.	As certified, ------------	5394
8.55	7.50	5.32	7.00	1 60	Manufactured from white corn.	As certified, ------------	6172
8.90	7.50	4.85	7.00	1 50	Manufactured from white corn.	As certified, ------------	6010
8.93	7.50	4.80	7.00	30 00	Manufactured from white corn.	As certified, ------------	5675
9.02	--------	4.94	--------	29 75			
7.04	8.00	4.40	5.00	1 35	--------------------------	Hominy feed, ----------	5396
7.70	8.00	4.95	5.00	27 00	Made from best grade of white milling corn.	As certified, ------------	5411
8.15	6.00	5.05	5.00	1 55	Made from best grade of white milling corn.	As certified, ------------	6132
8.13	7.00	4.15	4.50	23 00	Made from pure white corn.	As certified, ------------	5385
8.13	8.00	3.77	5.00	1 30	--------------------------	Hominy feed, ----------	5413
7.83	--	4.46	--------	26 80			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6112	------ The Lee Milling Co., Wilmington, Del.	Chester, John Thompson,--	814	6.56	11.56	10.00
6059	Steam Cooked, Miner-Hillard Milling Co., Wilkes- Barre, Pa.	Chalfont, F. D. Hartzel's Sons.	761	9.33	11.00	10-12
5246	"Pure," National Feed Co., St. Louis, Mo.	Palmyra, The Londonderry Mills.	46	9.22	10.00	8.5-10.5
6182	"Yellow," The Quaker Oats Co., Chicago, Ill.	Jeannette, Keystone Supply Co.	884	10.94	11.31	9.00
5355	"Yellow," The Quaker Oats Co., Chicago, Ill.	Uniontown, King Bros., --	153	11.16	10.06	9.00
5939	"Yellow," The Quaker Oats Co., Chicago, Ill.	Oil City, Magee Feed Co.,	655	10.65	11.50	9.00
		Average, --------------	--------	10.91	10.96	--------
6140	"Logan," The Standard Cereal Co., Chillicothe, Ohio.	Elizabethtown, E. H. Lehman.	842	10.41	12.06	10.00
5322	"Logan," The Standard Cereal Co., Chillicothe, Ohio.	Ephrata, S. M. Seldomridge.	120	9.90	10.31	10.00
		Average, --------------	--------	10.15	11.19	--------
5323	"Standco," The Standard Cereal Co., Chillicothe, Ohio.	Ephrata, S. M. Seldomridge.	121	11.55	11.25	11.50
5325	Pure, The Standard Cereal Co., Chillicothe, Ohio.	Kinzer, E. E. & W. J. L. Walker.	123	8.89	10.75	8.00
		Total average, ------	-------	9.62	11.02	--------
	Corn Bran.					
5281	Pure, M. F. Baringer, Philadelphia, Pa.	Lancaster, Esbenshade & Co.	79	7.69	10.06	7.00
5421	Pure White, M. F. Baringer, Philadelphia, Pa.	West Chester, E. D. Hemphill.	219	8.48	10.94	7-10
6120	Pure, M. F. Baringer, Philadelphia, Pa.	Chester, T. Frank McCall,	822	6.85	9.88	7.00
5818	Pure, M. F. Baringer, Philadelphia, Pa.	Longsdorf, James P. Myers.	47	7.92	11.44	7.00
6044	Pure, M. F. Baringer, Philadelphia, Pa.	Doylestown, J. W. Stilwagon & Son.	746	8.71	11.50	7.00
		Average, --------------	--------	7.93	10.76	--------
5295	------ John W. Eshelman, Lancaster, Pa.	Lancaster, John W. Eshelman.	93	14.16	9.13	7-9
6107	Pure, Chas. A. Krause Milling Co., Milwaukee, Wis.	Hatfield, George S. Snyder Estate.	809	7.29	9.75	7.00
6055	Badger Cream Flakes, Chas. A. Krause Milling Co., Milwaukee, Wis.	Doylestown, Henry S. Beidler.	757	7.71	10.00	8.50
6075	Badger Cream Flakes, Chas. A. Krause Milling Co., Milwaukee, Wis.	Lansdale, A. C. Godshall & Co., Inc.	777	8.28	10.50	8.50
		Average, --------------	--------	7.99	10.25	--------
6094	Pure, J. C. Landis, Norristown, Pa.	West Point, Heebner & Krieble.	796	9.32	[illegible]	[illegible].00
6091	White, L. W. Mattern, West Point, Pa.	West Point, L. W. Mattern,	793	8.1[illegible]	11.[illegible]	8.00
6103	------ George S. Snyder Estate, Hatfield, Pa.	Hatfield, George S. Snyder Estate.	805	10.30	12.00	7-10

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat. Found.	Crude Fat. Guaranteed.	Crude Fiber. Found.	Crude Fiber. Guaranteed.	Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Per ct.	Per ct.	Per ct.	Per ct.				
8.95	8.00	5.50	5.00	$1 70		Hominy feed,	6112
6.75	7.5–9	4.85	3–5	31 50		Hominy feed.	6059
7.28	7–8.5	4.50	10.00	27 00	Made from pure corn,	As certified,	5246
7.60	4.00	3.45	4.00	34 00		Hominy feed,	6182
6.75	4.00	3.12	4.00	25 00		Hominy feed,	5355
8.05	4.00	2.40	4.00	32 00		Hominy feed,	5939
7.47	--------	2.99	--------	30 33			
8.15	7.00	4.85	6.00	31 00		Hominy feed,	6140
7.78	7.00	3.12	6.00	25 00		Hominy feed,	5322
7.97	--------	3.98	--------	28 00			
8.45	8.00	1.87	4.00	25 50		Hominy feed,	5323
8.00	6.00	4.35	10.00	25 00		Hominy feed,	5325
8.04	--------	3.94	--------	28 56			
8.65	5.00	6.85	15.00	24 50	Corn bran,	As certified,	5281
10.54	5–7	7.40	12.00	26 00		Corn bran,	5421
9.80	5.00	11.05	15.00	30 00		Corn bran,	6120
12.22	5.00	8.77	15.00	25 00		Corn bran,	5818
10.90	5.00	5.80	15.00	32 00		Corn bran,	6044
10.42	--------	7.94	--------	27 50			
3.45	3–5	3.55	7–9	21 50		Corn bran,	5295
7.90	3.50	8.72	15.00	1 60		Corn bran,	6107
8.18	3.50	8.37	9.00	33 00	Made from pure white corn.	As certified,	6055
8.38	3.50	8.10	9.00	1 65	Made from pure white corn.	As certified,	6075
8.28	--------	8.23	--------	33 00			
7.65	6.00	9.50	8.00	32 00		Corn bran,	6094
8.20	5.00	6.50	10.00	32 00		Corn bran,	6091
9.18	3–5	4.90	12–15	27 00		Corn bran,	6103

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6090	Maizeline Feed, C. W. Wager & Co., Philadelphia, Pa.	West Point, L. W. Mattern.	792	6.90	10.13	7.00
		Total average, -------	--------	8.59	10.48	--------
	Corn Flour.					
5820	Maizo Reddog, Chas A. Krause Milling Co., Milwaukee, Wis.	Mechanicsburg, A. B. Harnish.	49	10.69	7.94	9.00
	WHEAT OFFALS.					
	Low Grade Flour.					
5793	Badger Red Dog, Berger-Crittenden Milling Co., Milwaukee, Wis.	Kutztown, S. A. Stein, ----	29	10.57	18.13	16.75
5641	Pure Wheat Red Dog, George C. Christian, Minneapolis, Minn.	Wellsboro, Equity Co-Operative Exchange.	439	11.71	18.13	15.60
6181	Foundry, B. A. Eckhart Milling Co., Chicago, Ill.	Jeannette, Keystone Supply Co.	883	11.10	17.56	--------
5341	------ New Stanton Mills, New Stanton, Pa.	New Stanton, New Stanton Mills.	139	11.64	18.56	--------
5973	Pullsbury's XX Daisy, Pillsbury Flour Mills, Minneapolis, Minn.	Pitcairn, D. F. Salyards,--	675	11.31	19.06	16.00
5513	------ George Urban Milling Co., Buffalo, N. Y.	Bradford, L. A. Fischer & Co.	311	10.24	18.56	--------
5491	Adrian, Washburn-Crosby Co., Minneapolis, Minn.	Johnsonburg, Cash Wholesale Co.	289	11.10	19.75	17.00
		Average, -------------	--------	11.09	18.54	--------
	Wheat Middlings.					
5489	Perfection Fancy White Winter, Ames-Burns Co., Jamestown, N. Y.	Warren, T. N. Dunham, --	287	11.03	17.00	15-17
5251	------ Austen Bros., Pittsburg, Pa.	Johnstown, Valley Mills, --	51	10.20	15.56	--------
5561	Pure, Barber Milling Co., Minneapolis, Minn.	Ebensburg, Veith Bros., --	359	10.45	18.94	14-18
5327	Badger Standard, Berger-Crittenden Milling Co., Milwaukeee, Wis.	Latrobe, Latrobe Wholesale Grocery.	125	10.39	17.94	16.50
5844	------ Berger-Crittenden Milling Co., Milwaukee, Wis.	Sharon, The Sharon Milling Co.	581	10.75	14.69	--------
6035	------ Blaine, Mackay-Lee Co., North East, Pa.	Corry, F. L. Heath, -----	737	10.59	16.88	--------
5659	------ Blank & Gottshall, Sunbury, Pa.	Sunbury, Blank & Gottshall.	457	12.60	15.44	--------
5619	------ W. N. Brosha, Jersey Shore, Pa.	Jersey Shore, W. N. Brosha.	417	9.81	18.25	--------
5791	Pure Wheat White, George C. Christian, Minneapolis, Minn.	Meyersdale, Appel & Glessner.	561	10.15	17.19	14.00
5792	Poland, George C. Christian, Minneapolis, Minn.	Meyersdale, Appel & Glessner.	562	10.41	17.13	14.00
5750	Coarse, The Cleveland Milling Co., Cleveland, Ohio.	Brookville, Kline's Flour and Feed Mill.	532	10.37	18.25	14-17
5336	Coarse, The Cleveland Milling Co., Cleveland, Ohio.	Greensburg, Harry Orr & Co.	134	10.74	19.56	14-17

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
9.10	4.00	7.07	13.00	$32 00	--------	Corn bran, --------	6090
8.78	--------	7.42	--------	29 23			
4.37	6.00	1.32	2.00	32 00	A pure corn product, ----	As certified, --------	5820
3.95	3.75	2.45	2.50	1 75	Pure and unadulterated wheat product.	As certified, --------	5793
4.70	3.50	1.72	4.00	31 00	Pure wheat red dog flour,	As certified, --------	5641
3.90	--------	3.15	--------	1 95	--------	Flour middlings, -------	6181
4.08	--------	2.45	--------	29 00	Red dog middlings, ------	As certified, --------	5341
5.08	4.50	3.10	4.00	1 90	--------	Flour middlings, -------	5973
4.15	--------	0.82	--------	1 65	--------	Flour middlings, -------	5513
5.03	5.00	2.17	4.00	1 80	Pure hard wheat flour, --	As certified, --------	5491
4.41	--------	2.27	--------	34 43			
4.40	5–7	3.67	10.00	32 00	Pure winter wheat product.	As certified, --------	5489
4.58	--------	5.42	--------	1 50	Wheat middlings, --------	As certified, --------	5251
5.55	4–6	7.05	8.00	1 50	Pure wheat middlings, -	As certified, --------	5561
4.90	4.00	8.12	8.50	27 00	Pure and unadulterated wheat product.	As certified, --------	5327
3.13	--------	3.45	--------	30 00	Wheat middlings, --------	As certified, --------	5844
4.48	--------	4.87	--------	1 75	Pure wheat product, -----	As certified, --------	6035
4.00	--------	3.17	--------	1 45	Wheat middlings, --------	As certified, --------	5659
4.90	--------	3.65	--------	1 50	Pure wheat middlings, --	As certified, --------	5619
5.93	4.00	5.72	8.00	1 65	Pure wheat middlings, -	As certified, --------	5791
6.00	4.00	7.30	8.00	1 55	Pure wheat middlings, --	Wheat middlings and small amount of flax and weed seeds.	5792
5.08	4.5–6.5	5.45	--------	1 45	Natural run of wheat, --	As certified, --------	5750
6.10	4.5–6.5	6.10	--------	1 40	Natural run of wheat, --	As certified, --------	5336

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5401	Pure Fine, The Cleveland Milling Co., Cleveland, Ohio.	York, F. Z. Stauffer, ----	199	11.83	16.94	--------
5267	------ The Colton Bros. Co., Bellefontaine, Ohio.	Zelienople, Fred Zehner, --	65	11.83	16.94	15.00
5534	Fancy, Crouch Bros. Co., Erie, Pa.	Lock Haven, F. H. Dyer,	332	10.61	16.63	14.00
5785	Pure, The Davis Milling Co., St. Joseph, Mo.	Somerset, John G. Emert,	555	8.40	17.06	13.00
5384	Pure, B. A. Eckhart Milling Co., Chicago, Ill.	York, F. Loucks & Son, --	182	9.86	17.06	15.00
5781	Pure, B. A. Eckhart Milling Co., Chicago, Ill.	Somerset, Saylor & Woy,--	551	9.15	17.50	15.00
5529	Pure, Emporium Milling Co., Emporium, Pa.	Emporium, C. B. Howard & Co.	327	11.14	15.88	15.00
5521	------ Eulalia Mills, Coudersport, Pa.	Coudersport, Eulalia Mills,	319	10.56	16.31	--------
5878	------ J. B. Ewing, Orbisonia, Pa.	Orbisonia, J. B. Ewing, --	615	9.93	18.13	--------
5578	Pure, Gamble, Gheen & Co.. Bellefonte, Pa.	Philipsburg, Wolf's Mill, --	376	10.73	17.94	--------
5863	------ The Goshen Milling Co., Goshen, Ind.	Canonsburg, Canonsburg Milling Co.	600	10.32	17.06	18.00
6156	------ John D. Graybill, Bellville, Pa.	Lewistown, Lewistown Ice and Storage Co.	858	10.70	15.69	--------
5868	------ Huntingdon Milling Co., Huntingdon, Pa.	Huntingdon, Huntingdon Milling Co.	605	11.88	16.38	--------
5850	Saxony Choice White, Hunter-Robinson-Wenz Milling Co., St. Louis, Mo.	Washington, D. P. Hart,	587	9.68	18.25	15.00
5306	Flour, W. J. Jennison Co., Minneapolis, Minn.	Lancaster, Fred Poutz, ---	104	11.55	18.13	17.00
5228	------ Lebanon Milling Co., Lebanon, Pa.	Lebanon, Lebanon Milling Co.	28	11.90	17.13	--------
5283	------ Levan & Sons, Lancaster, Pa.	Lancaster, Levan & Sons,	81	12.27	15.38	--------
5647	Elmco, Listman Mill Co., La Crosse, Wis.	Knoxville, J. H. Burch, ---	445	10.70	18.38	17.66
6176	------ Manbeck. Nelson & Co., Mifflin, Pa.	Mifflin, Manbeck, Nelson & Co.	878	10.08	16.56	--------
5836	------ Mathers Bros., Greenville, Pa.	Greenville, Mathers Bros.,	573	10.02	16.56	--------
5983	------ R. S. McCague, Pittsburg, Pa.	Pittsburg, James Brown & Co.	685	10.46	16.63	--------
6162	------ Mexico Roller Mills, Mexico, Pa.	Lewistown, G. M. White,	864	10.85	16.25	--------
5505	------ Niagara Falls Milling Co., Buffalo, N. Y.	Smethport, C. Herzog, ---	303	10.84	19.00	--------
5235	Pure, The Northwestern Consolidated Milling Co., Minneapolis, Minn.	Palmyra, A. S. Stauffer,	35	10.57	17.00	15.00
5554	White Flour, Northwestern Milling Co., Little Falls, Minn.	Clearfield, J. W. Eberts,--	352	10.32	18.94	16.00
5547	------ C. H. Notter, Du Bois, Pa.	Du Bois, C. H. Notter, --	345	10.58	15.94	--------
5575	------ A. Nowak & Son, Buffalo, N. Y.	Philipsburg, Philipsburg Grist Mill Co.	373	10.53	19.13	15.00
5576	Red Dog, A. Nowak & Son, Buffalo, N. Y.	Philipsburg, Philipsburg Grist Mill Co.	374	11.08	66.19	17.00
5558	Fancy, Osakis Milling Co., Osakis, Minn.	Carrolltown, W. A. Eckenrode.	356	10.44	18.44	15.00
6033	Pure, The Richard & Evans Co., Cortland, Ohio.	Corry, W. A. Dodd, ------	735	11.47	16.63	--------
5722	Pure, The Richard & Evans Co., Cortland, Ohio.	Elwood City, J. P. Morison.	520	9.97	17.63	--------
5841	Pure, The Richard & Evans Co., Cortland, Ohio.	Sharon, J. M. Porter, ----	578	9.90	17.56	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.08	--------	3.05	--------	$1 60	Pure fine middlings,	As certified,	5401
3.90	4.00	6.45	6.00	30 00	--------	Wheat middlings,	5267
3.73	3.50	2.70	3.12	1 60	Fancy wheat middlings,	As certified,	5534
4.83	4.00	5.87	5.00	1 60	Pure wheat middlings or shorts.	As certified,	5785
4.70	4.00	4.50	6.00	1 50	Pure wheat flour middlings.	As certified,	5384
5.33	4.00	7.02	6.00	1 50	Pure wheat middlings,	As certified,	5781
3.50	3.00	2.37	--------	1 60	Pure wheat middlings,	As certified,	5529
3.80	--------	2.82	--------	1 50	Wheat middlings,	As certified,	5521
5.70	--------	4.20	--------	1 60	Wheat middlings,	As certified,	5878
5.28	--------	5.15	--------	1 65	--------	Wheat middlings,	5578
4.48	5.00	4.57	7.00	34 00	--------	Wheat middlings,	5863
5.25	--------	4.17	--------	1 60	Wheat middlings,	As certified,	6156
3.68	--------	1.97	--------	32 00	Wheat middlings,	As certified,	5868
6.20	4.00	4.35	6.00	1 75	Pure winter wheat product.	As certified,	5850
5.33	4.50	4.75	5.50	28 00	Pure wheat middlings,	As certified,	5306
5.10	--------	4.22	--------	1 40	Wheat middlings,	As certified,	5228
3.90	--------	2.90	--------	28 50	Wheat middlings,	As certified,	5283
5.35	4.52	5.37	5.61	1 60	Wheat middlings,	As certified,	5647
4.05	--------	4.35	--------	1 55	Wheat middlings,	As certified,	6176
4.25	--------	3.82	--------	1 40	Wheat middlings,	As certified,	5836
4.60	--------	5.17	--------	1 65	Wheat middlings,	As certified,	5983
3.95	--------	3.20	--------	1 60	--------	Wheat middlings,	6162
5.83	--------	7.65	--------	1 50	Wheat middlings,	As certified,	5505
6.35	4.50	10.30	10.00	28 00	Pure wheat middlings,	As certified,	5235
5.28	4.50	5.60	6.70	1 60	White flour middlings,	As certified,	5554
3.23	--------	2.12	--------	1 80	Pure wheat middlings,	As certified,	5547
6.15	4.00	5.10	8.00	29 00	--------	Wheat middlings,	5575
3.68	5.00	3.50	4.00	32 00	--------	Wheat middlings,	5576
6.28	4.00	6.00	8.00	1 60	Pure wheat middlings,	As certified,	5558
3.85	--------	2.90	--------	35 00	Wheat middlings,	As certified,	6033
4.88	--------	4.42	--------	1 60	Wheat middlings,	As certified,	5722
4.60	--------	4.30	--------	1 60	Wheat middlings,	As certified,	5841

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6166	------ John T. Rodgers, McVeytown, Pa.	McVeytown, John T. Rodgers.	868	12.21	19.00	--------
5583	------ Security Flour Mills Co., Abilene, Kansas.	Morrisdale Mines, Morrisdale Feed and Grain Co.	381	10.01	18.75	--------
5893	Fresh Ground, W. G. Smith, Yellow Creek, Pa.	Everett, A. H. Whetstone,	630	11.72	17.25	--------
5363	Pure, J. W. Smith & Co., Chicago, Ill.	Uniontown, Hogsett & Hawkins.	161	10.07	17.31	15.00
5440	Pure, W. H. Stokes Milling Co., Watertown, S. Dak.	Beaver Falls, Dodds & Garrett.	238	10.65	19.31	16.50
5743	------ Sylvia Milling Co., Sylvia, Kans.	Reynoldsville, Wallace & Stefl.	525	8.30	17.56	--------
5882	Pure Wheat Flour, Tennant Hoyt Co., Lake City, Minn.	Hopewell, M. V. Zeth, -----	619	10.27	17.88	16.00
5483	No. 1 White, The Toledo Grain and Milling Co., Toledo, Ohio.	Ridgway, Smith Bros. Co.,	281	10.81	17.38	--------
5611	------ V. S. Truckenmiller & Son, Watsontown, Pa.	Williamsport, F. W. Dawson & Son.	409	10.05	17.38	--------
5511	Flour, George Urban Milling Co., Buffalo, N. Y.	Bradford, L. A. Fischer & Co.	309	9.88	18.56	--------
5512	------ George Urban Milling Co., Buffalo, N. Y.	Bradford, L. A. Fischer & Co.	310	9.20	17.88	--------
5535	------ G. R. Warrick, Mackeyville, Pa.	Lock Haven, F. H. Dyer, --	333	10.05	18.38	--------
5314	Standard, Washburn-Crosby Co., Minneapolis, Minn.	Manheim, F. K. Nauman,	112	10.96	18.63	15.00
5814	Pure Hard Wheat Standard, Washburn-Crosby Co., Minneapolis, Minn.	Boiling Springs, Paxton Flour and Feed Co.	43	9.17	18.75	15.00
5900	Fancy Mixed, Wells Flour Milling Co., Wells, Minn.	Bloomsburg, R. R. Ikeler,	62	8.90	18.44	14–21
		Average, -------------	--------	10.50	17.43	--------
	Wheat Middlings with Admixtures.					
5811	Gem Middlings, T. M. Biddle, Altoona, Pa.	Juniata, R. I. Remaley, --	569	10.39	16.06	10.10
5441	Refuse Middlings, Jones & Laughlin Co., Woodlawn, Pa.	New Brighton, J. H. Hornby & Son.	239	7.20	15.38	12.63
5767	No. 2, White Middlings and Corn Meal, The Toledo Grain and Milling Co., Toledo, Ohio.	Penfield, Johnson & Overturf.	537	9.23	15.81	12–14
5891	No. 2, White Middlings and Corn Meal, The Toledo Grain and Milling Co., Toledo, Ohio.	Everett, L. C. Mann & Co.	628	10.23	15.00	12–14
6191	No. 2, White Middlings and Corn Meal, The Toledo Grain and Milling Co., Toledo, Ohio.	Wilmerding, Routh & Co.,	893	11.00	14.63	12–14
		Average, -------------	--------	10.15	15.15	--------
	Mixed Feed:—Wheat By-Products.					
5484	------ Alma Roller Mills, Alma, Mich.	Warren, T. N. Dunham, --	282	10.31	16.63	16.10
5536	------ Crouch Bros. Co., Pa.	Lock Haven, F. H. Dyer,	334	9.76	15.50	14.50

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat. Found.	Crude Fat. Guaranteed.	Crude Fiber. Found.	Crude Fiber. Guaranteed.	Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Per ct.	Per ct.	Per ct.	Per ct.				
4.85	--------	3.30	--------	$1 60	Wheat middlings,	As certified,	6166
5.18	--------	6.00	--------	30 00	--------	Wheat middlings,	5583
3.95	--------	3.17	--------	1 70	Fresh ground middlings,	As certified,	5893
4.95	4.00	6.07	6.00	28 00	Pure wheat middlings,	As certified,	5363
5.50	5.00	5.27	5.59	26 50	Pure wheat shorts,	As certified,	5440
4.80	--------	4.15	--------	1 60	--------	Wheat middlings,	5743
5.63	--------	5.25	--------	1 75	Pure wheat middlings,	As certified,	5882
5.00	--------	2.82	--------	1 85	Pure and unadulterated wheat middlings.	As certified,	5483
3.95	--------	5.20	--------	1 55	Pure wheat middlings,	As certified,	5611
5.25	--------	4.37	--------	1 50	--------	Wheat middlings,	5511
4.55	--------	5.20	--------	1 40	--------	Wheat middlings,	5512
5.20	--------	7.37	--------	1 50	Wheat middlings,	As certified,	5535
5.65	4.00	6.42	8.00	28 00	Pure hard wheat standard middlings.	As certified,	5314
5.75	4.00	7.50	9.00	28 00	Pure hard wheat standard middlings.	As certified,	5814
5.90	5–54	5.60	6–12	30 00	--------	Wheat middlings,	5900
4.52	--------	4.80	--------	30 98			
5.46	2.10	2.87	11.30	1 65	Wheat middlings, red dog flour and hominy feed.	As certified,	5811
6.25	3.64	10.65	4.60	24 00	Wheat middlings and palm oil.	As certified,	5441
5.33	4–6	5.10	6.00	1 75	Wheat middlings and fine white corn meal.	As certified,	5767
4.73	4–6	4.90	6.00	1 65	Wheat middlings and fine white corn meal.	As certified,	5891
4.83	4–6	3.99	6.00	1 85	Wheat middlings and fine white corn meal.	As certified,	6191
4.96	--------	4.66	--------	35 00			
4.78	4.20	7.30	--------	26 00	Bran and middlings,	As certified,	5484
4.18	4.30	5.30	8.30	1 50	--------	Wheat bran and wheat middlings.	5536

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6170	Fancy Wheat, Pillsbury Flour Mills, Minneapolis, Minn.	McVeytown, W. M. Atkinson.	872	10.25	17.44	16.00
5759	Pure Hard Wheat Superior Mixed Feed, Washburn-Crosby Co., Minneapolis, Minn.	Montrose, Slatter & Roberts.	22	10.28	17.63	16.00
		Average, ----------	--------	10.90	16.80	--------
	Wheat Bran.					
6030	Perfection Extra Fancy Winter, Amos-Burns Co., Jamestown, N. Y.	Erie, W. J. Carroll, ------	732	10.38	16.50	14-16
5987	------ The Ansted & Burk Co., Springfield, Ohio.	Derry, J. O. Nicely, ------	689	10.28	16.50	14-15
5361	------ The Ansted & Burk Co., Springfield, Ohio.	Uniontown, Hogsett & Hankins.	159	10.14	16.25	14-15
6197	------ The Ansted & Burk Co., Springfield, Ohio.	Pittsburg, Daniel McCaffrey's Sons Co.	899	9.75	16.69	14-15
5238	Winona, Fancy Flaky, Bay State Milling Co., Winona, Minn.	Palmyra, A. S. Stauffer,--	38	11.21	16.50	15.00
5996	Badger, Berger-Crittenden Milling Co., Milwaukee, Wis.	Braddock, Braddock Feed Co.	698	8.89	16.44	16.00
6199	Badger, Berger-Crittenden Milling Co., Milwaukee, Wis.	Pittsburg, Daniel McCaffrey's Sons Co.	901	9.98	17.06	16.00
5843	Badger, Berger-Crittenden Milling Co., Milwaukee, Wis.	Sharon, The Sharon Milling Co.	580	9.60	16.06	16.00
6005	Badger, Berger-Crittenden Milling Co., Milwaukee, Wis.	Meadville, Shérman Milling Co.	707	9.64	16.38	16.00
5571	Big Diamond, Big Diamond Milling Co., Minneapolis, Minn.	Madera, Moore Bros., ----	369	9.03	16.75	12.80
5660	------ Blank & Gottshall, Sunbury, Pa.	Sunbury, Blank & Gottshall.	458	11.50	16.94	--------
5618	------ W. N. Brosha, Jersey Shore, Pa.	Jersey Shore, W. N. Brosha.	416	9.38	17.19	--------
5677	------ Buffalo Flour Milling Co., Lewisburg, Pa.	Northumberland, Meiser & Bolig.	475	10.43	16.63	--------
5360	Jersey, George C. Christian, Minneapolis, Minn.	Uniontown, King Bros., --	158	10.75	16.88	13.00
5982	------ The Cleveland Milling Co., Cleveland, Ohio.	Pittsburg, James Brown & Co.	684	10.60	17.25	14-17
5747	------ The Cleveland Milling Co., Cleveland, Ohio.	Brookville, Kline's Flour and Feed Mill.	529	10.26	17.38	14-17
5400	------ The Cleveland Milling Co., Cleveland, Ohio.	York, F. Z. Stauffer, ---	198	11.49	17.19	14-17
5879	------ H. C. Cole Milling Co., Chester, Ill.	Mt. Union, J. E. Ewing, --	616	8.98	16.13	14.50
5574	Commander, Commander Mill Co., Minneapolis, Minn.	Philipsburg, Philipsburg Grist Mill Co.	372	9.07	17.13	14.00
6023	Winter, W. A. Coombs Milling Co., Cold Water, Mich.	Erie, Weddige Bros., ----	725	10.22	15.31	14-17
5498	Duluth Imperial, Duluth Superior Milling Co., Duluth, Minn.	St. Marys Hall, Kaul & Hyde Co.	296	9.75	16.94	14.50
5649	------ Eaker & Vermilya, Muncy, Pa.	Knoxville, Deerfield Milling Co.	447	11.18	16.06	--------
5796	Eaco Winged Horse, Everett Aughenbaugh & Co., Waseca, Minn.	Fleetwood, Schlegel, Adam & Co.	32	8.95	16.56	14.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
5.05	4.50	6.62	8.00	$1 60	Wheat bran and white middlings.	As certified, ----------	6170
5.13	4.50	7.32	9.00	29 00	Composed of wheat bran and middlings only.	As certified, ----------	5759
4.79	-------	6.63	-------	26 25			
4.63	3.5-5	7.05	10.00	1 45	Pure winter wheat product.	As certified. ----------	6030
4.50	3-4.50	9.05	9-11.5	1 50	-------------------------	Wheat bran, ----------	5987
4.45	3.7-4.5	9.10	9-11.5	27 00	-------------------------	Wheat bran, ----------	5361
4.83	3-4	8.92	8-11	1 50	-------------------------	Wheat bran, ----------	6197
5.95	4.07	10.15	11.00	27 00	Pure wheat bran, -------	As certified, ----------	5238
4.78	4.00	9.80	10.50	1 40	-------------------------	Wheat bran, ----------	5996
4.53	4.00	9.40	10.50	1 50	Pure wheat bran, -------	As certified, ----------	6199
4.73	4.00	10.20	10.50	28 00	Pure wheat product, ----	As certified, ----------	5843
4.88	4.00	8.30	10.50	27 00	Pure wheat product, ----	As certified, ----------	6005
6.33	4.50	10.22	11.07	1 50	Pure wheat product, ----	As certified, ----------	5571
5.30	-------	8.10	-------	1 35	Wheat bran, ----------	As certified, ----------	5660
4.45	-------	9.27	-------	1 40	Pure wheat bran, -------	As certified, ----------	5618
5.20	-------	9.55	-------	1 40	Wheat bran, ----------	As certified, ----------	5677
5.48	4.00	9.17	11.50	1 40	Pure wheat bran, -------	As certified, ----------	5360
4.85	4.5-5.5	9.35	-------	1 50	Natural run of wheat, --	As certified, ----------	5982
5.70	4.5-5.5	9.05	-------	1 45	Natural run of wheat, --	As certified, ----------	5747
5.60	4.5-5.5	9.17	-------	1 45	Natural run of wheat, --	As certified, ----------	5400
4.95	3.75	7.50	9.50	1 50	Product of pure soft winter wheat.	As certified, ----------	5879
6.18	4.00	10.25	11.00	28 00	Pure wheat bran, -------	As certified, ----------	5574
4.35	3-6	7.72	-------	1 40	Winter wheat bran, -----	As certified, ----------	6023
5.43	4.00	9.40	11.25	1 50	Pure wheat bran, -------	As certified, ----------	5498
4.95	-------	9.87	-------	1 50	Wheat bran, ----------	As certified, ----------	5649
5.58	3.00	11.07	12.00	26 00	-------------------------	Wheat bran, ----------	5796

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6178	Pure, B. A. Eckhart Milling Co., Chicago, Ill.	Jeannette, Keystone Supply Co.	880	9.48	17.31	14–17
5780	Pure, B. A. Eckhart Milling Co., Chicago, Ill.	Somerset, Saylor & Woy, --	550	9.54	17.38	14–17
5617	------ Elmwood Mill and Elevator Co., Elmwood, Nebraska.	Williamsport, M. E. Donnel & Co.	415	10.05	15.31	--------
5533	------ Emporium Milling Co. Emporium, Pa.	Emporium, Emporium Milling Co.	331	10.10	16.31	--------
5877	------ J. B. Ewing, Orbisonia, Pa.	Orbisonia, J. B. Ewing, ---	614	8.97	17.25	--------
5415	------ Excelsior Roller Mills, Avondale, Pa.	Kennett Square, W. H. Walker & Co.	213	10.32	14.75	13.00
6158	------ John D. Graybill, Bellville, Pa.	Lewistown, Lewistown Ice and Storage Co.	860	7.86	16.88	--------
5472	------ The Harter Milling Co., Toledo, Ohio.	Parnassus, Johnston & Hamilton.	270	11.18	16.50	--------
6032	Repeater Winter, Hunter-Robinson - Wenz Milling Co., St. Louis, Mo.	Corry, W. A. Dodd, ------	734	9.22	16.31	14.50
5849	Dreadnought Extra Coarse, Hunter - Robinson - Wenz Milling Co., St. Louis, Mo.	Washington, D. P. Hart, --	586	9.55	15.69	14.50
5495	Dreadnought Extra Coarse, Soft, Hunter - Robinson Wenz Milling Co., St. Louis, Mo.	St. Mary's, L. Ritter, ----	293	10.41	15.88	14.50
5870	------ Huntingdon Milling Co., Huntingdon, Pa.	Huntingdon, Huntingdon Milling Co.	607	10.06	17.94	--------
5813	Pure Spring, Jennison Bros. & Co., Janesville, Minn.	Mt. Holly, Percy Harman,	42	9.35	15.75	15.00
5305	------ W. J. Jennison Co., Minneapolis, Minn.	Lancaster, Fred Pontz, --	103	10.67	15.75	15.00
5958	Anchor, Kemper Mill and Elevator Co., Kansas City, Mo.	Hancock, J. C. Cook, ----	87	10.64	15.06	14.50
5338	Anchor, Kemper Mill and Elevator Co., Kansas City, Mo.	Greensburg, Harry Orr & Co.	136	10.77	16.81	14.50
5621	Anchor, Kemper Mill and Elevator Co., Kansas City, Mo.	Williamsport, John T. Stahlnecker.	419	9.13	15.56	14.50
5227	------ Lebanon Milling Co., Lebanon, Pa.	Lebanon, Lebanon Milling Co.	27	11.43	15.25	--------
5794	Elmco Fancy, Listman Milling Co., La Crosse, Wis.	Lyons, Hock Bros., ------	30	9.33	17.38	16.69
6175	------ Manbeck, Nelson & Co., Mifflin, Pa.	Mifflin, Manbeck, Nelson & Co.	877	10.49	17.56	--------
5835	------ Mathers Bros., Greenville, Pa.	Greenville, Mathers Bros.,	572	9.76	16.19	--------
5663	Mixed, Mauser Mill Co., Laurys, Pa.	Mt. Carmel, Schneider Bros. & Co.	461	10.39	15.81	12–16
5858	------ McMorran Bros., St. Paris, Ohio.	Canonsburg, Dunlap Bros.,	595	11.04	17.13	--------
5265	Pure Winter, National Feed Co., St. Louis, Mo.	Zelienople, Fred Zehner, --	63	10.89	16.00	14.00
5412	Seal of Minnesota, New Prague Flouring Mill Co., New Prague, Minn.	West Grove, S. K. Chambers & Bro.	210	10.40	14.94	13.50
5253	Seal of Minnesota, New Prague Flouring Mill Co., New Prague, Minn.	Johnstown, Valley Mills, --	53	10.97	15.38	13.50
5532	Pure, The Northwestern Consolidated Milling Co., Minneapolis, Minn.	Emporium, Emporium Milling Co.	330	9.34	15.88	14.50
5231	Pure, The Northwestern Consolidated Milling Co., Minneapolis, Minn.	Annville, Gantz & Newgard,	31	10.23	17.44	14.50

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.93	3–5	8.80	--------	$30 00	Pure wheat bran, -------	As certified. ------------	6178
5.13	3–5	9.80	--------	1 50	Pure wheat bran, -------	As certified. ------------	5780
4.75	--------	7.97	--------	1 50	Wheat bran, ------------	As certified. ------------	5617
4.75	--------	7.50	--------	1 45	Wheat bran, ------------	As certified. ------------	5333
4.53	--------	9.00	--------	1 40	Wheat bran, ------------	As certified. ------------	5877
5.25	4.00	9.67	10.00	27 50	----------------------------	Wheat bran. -----------	5415
4.58	--------	8.97	--------	1 40	Wheat bran, ------------	As certified, ------------	6158
4.40	--------	8.92	--------	30 00	Harters' pure wheat bran,	As certified, ------------	5472
4.95	4.00	7.75	9.50	25 00	Pure winter wheat product.	As certified. ------------	6032
4.75	4.00	8.62	9.50	30 00	Pure winter wheat product.	As certified. ------------	5849
4.85	4.00	8.12	9.50	1 45	Pure winter wheat product.	As certified, ------------	5495
4.80	--------	8.95	--------	28 00	Wheat bran, ------------	As certified, ------------	5870
6.00	4.00	10.15	11.00	27 00	----------------------------	Wheat bran. -----------	5813
5.50	4.00	9.85	10.00	26 25	Pure wheat bran, ------	As certified. ------------	5305
4.75	4.00	10.45	9.50	28 00	Made from pure wheat,--	As certified, ------------	5958
4.40	4.00	9.60	9.50	1 35	Made from pure wheat,--	As certified. ------------	5338
4.48	4.00	4.72	9.50	1 40	Made from pure wheat.--	As certified. ------------	5621
4.33	--------	8.50	--------	1 85	Wheat bran, ------------	As certified, ------------	5227
5.43	4.18	9.72	11.37	28 00	----------------------------	Wheat bran. -----------	5794
4.10	--------	8.62	--------	1 45	Wheat bran, ------------	As certified, ------------	6175
5.45	--------	8.77	--------	1 25	Wheat bran, ------------	As certified. ------------	5835
5.15	3–4	8.22	6–10	1 50	Bran feed, --------------	Wheat bran. -----------	5663
4.13	--------	7.80	--------	27 80	Wheat bran, -----------	As certified. ------------	5858
4.23	4.00	7.42	8.00	28 00	Made from pure wheat,--	As certified. ------------	5265
5.70	4.00	11.30	12.05	27 00	Pure and unadulterated	As certified. ------------	5412
5.50	4.00	9.97	12.05	1 40	Pure and unadulterated wheat bran.	As certified, ------------	5253
6.05	4.00	10.70	11.00	1 45	Pure wheat bran, -------	As certified, ------------	5532
5.65	4.00	9.37	11.00	26 00	Pure wheat bran, -------	As certified, ------------	5231

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5408	Pure, The Northwestern Consolidated Milling Co. Minneapolis, Minn.	Downingtown, Wells & Walker.	206	11.35	17.06	14.50
5555	Fancy Spring, Northwestern Milling Co., Little Falls, Minn.	Clearfield, J. W. Eberts, --	353	9.86	16.38	12.50
5548	------ C. H. Notter, Du Bois, Pa.	Du Bois, C. H. Notter, ---	346	9.56	17.44	--------
5559	Fancy, Osakis Milling Co., Osakis, Minn.	Carrolltown, W. A. Eckenrode.	357	10.19	14.75	14.00
6171	------ Pillsbury Flour Mills, Minneapolis, Minn.	McVeytown, W. M. Atkinson.	873	10.07	16.00	14.50
5723	Pure, The Richard & Evans Co., Cortland, Ohio.	Elwood City, J. P. Morrison.	521	9.62	15.56	--------
5842	Pure, The Richard & Evans Co., Cortland, Ohio.	Sharon, J. M. Porter, -----	579	9.34	15.88	--------
6167	------ John T. Rodgers, McVeytown, Pa.	McVeytown, John T. Rodgers.	869	12.30	17.44	--------
5362	Pure, J. W. Smith & Co., Pittsburg, Pa.	Uniontown, Hogsett & Hankins.	160	9.80	16.25	14–17
5875	------ Spanogle-Yeager Milling Co., Lewistown, Pa.	Mapleton, H. O. Andrews,	612	9.22	16.50	--------
6163	------ Spanogle-Yeager Milling Co., Lewistown, Pa.	Lewistown, G. M. White, --	865	9.65	17.25	--------
6036	Pure, Star and Crescent Milling Co., Chicago, Ill.	Corry, F. L. Heath, ----	738	9.70	16.75	15.00
5744	------ Sylvia Milling Co., Sylvia, Kans.	Reynoldsville, Wallace & Stefl.	526	8.91	16.44	--------
5970	Pure, Tennant & Hoyt Co., Lake City, Minn.	Manor, Hiram Altman & Son.	672	11.92	15.81	13.20
5752	------ Thornton & Chester Milling Co., Buffalo, N. Y.	Clarion, B. W. Thompson,	534	9.68	15.13	14–18
5892	Winter, The Toledo Grain and Milling Co., Toledo, Ohio.	Everett, L. C. Mann & Co.	629	9.59	17.31	--------
6192	Winter. The Toledo Grain and Milling Co., Toledo, Ohio.	Wilmerding, Routh & Co.,	894	9.57	17.38	--------
5612	------ V. S. Truekenmiller & Son, Watsontown, Pa.	Williamsport, F. W. Dawson & Son.	410	9.31	16.38	--------
6037	Pure, Union Mill Co., Cedar Falls, Iowa.	Corry, F. L. Heath, -------	739	9.11	16.75	15.50
5492	Coarse, Washburn-Crosby Co., Minneapolis, Minn.	Johnsonburg, Cash Wholesale Co.	290	10.22	16.75	14.50
5991	Pure Hard Wheat Coarse, Washburn - Crosby Co., Minneapolis, Minn.	Braddock, Marriott & Sons,	693	10.64	16.31	14.50
5313	Coarse, Washburn-Crosby Co., Minneapolis, Minn.	Manheim, F. K. Nauman, --	111	11.60	15.31	14.50
6168	Pure Hard Wheat Coarse, Washburn - Crosby Co., Minneapolis, Minn.	McVeytown, John T. Rodgers.	870	10.49	15.88	14.50
5779	Z Pure, Zenith Milling Co., Kansas City, Mo.	Somerset, Saylor & Woy, --	549	9.83	15.94	14.50
5861	------ Unknown, ------------	Canonsburg, Canonsburg Milling Co.	598	9.93	16.44	--------
		Average, --------------	--------	10.05	16.41	--------
	RYE OFFALS.					
	Rye Middlings.					
5334	------ North Star Feed and Cereal Co., Minneapolis, Minn.	Greensburg, W. N. Davis, --	132	10.68	17.50	15.60

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
5.70	4.00	9.82	11.00	$27 00	Pure wheat bran.	As certified,	5408
5.20	3.70	10.30	--------	1 40	--------	Wheat bran,	5555
4.73	--------	8.60	--------	1 60	Pure wheat bran,	As certified,	5548
5.38	4.00	10.67	12.00	1 50	Pure wheat bran,	As certified,	5559
5.45	4.00	11.75	11.00	1 50	Pure wheat bran.	As certified.	6171
4.58	--------	9.25	--------	1 45	Wheat bran,	As certified,	5723
4.60	--------	9.17	--------	1 40	Pure wheat bran,	As certified,	5842
4.38	--------	8.27	--------	1 50	Wheat bran,	As certified,	6167
5.13	3-5	9.60	--------	27 00	Pure wheat bran,	As certified,	5362
5.00	--------	9.87	--------	1 50	Wheat bran,	As certified,	5875
4.55	--------	8.47	--------	1 50	--------	Wheat bran,	6163
5.25	4.00	9.55	10.00	1 45	Pure wheat bran,	As certified,	6036
5.18	--------	10.10	--------	1 40	--------	Wheat bran,	5744
5.25	4.90	10.10	13.10	26 00	Pure wheat bran,	As certified,	5970
5.33	3-6	10.62	--------	1 50	Pure wheat product,	As certified,	5752
4.93	--------	8.90	--------	1 40	Pure wheat bran,	As certified,	5892
4.80	--------	8.25	--------	1 65	Pure wheat bran,	As certified,	6192
4.20	--------	9.45	--------	1 50	Pure wheat bran,	As certified,	5612
5.58	4.00	9.52	10.50	1 45	Pure wheat bran,	As certified,	6037
5.60	4.00	9.67	11.00	1 40	Pure hard wheat bran,	As certified,	5492
5.05	4.00	9.52	11.00	1 60	Wheat bran,	As certified,	5991
5.25	4.00	9.45	11.00	27 00	Pure hard wheat coarse bran.	As certified,	5313
5.10	4.00	10.57	11.00	1 50	Pure wheat bran,	As certified,	6168
4.55	5.60	10.55	13.50	1 50	Pure wheat bran,	As certified,	5779
4.38	--------	8.25	--------	27 00	--------	Wheat bran,	5861
5.02	--------	9.22	--------	28 68			
3.10	4.00	3.32	9.00	1 30	Rye middlings,	As certified,	5334

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
5913	------ North Star Feed and Cereal Co., Minneapolis, Minn.	McKeesport, Keystone Commercial Co.	641	10.60	17.19	14.50
5354	------ North Star Feed and Cereal Co., Minneapolis. Minn.	Uniontown, King Bros., ---	152	10.16	17.69	14.50
		Average, -------------	--------	10.48	17.46	--------
	Mixed Feed:—Rye By-Products.					
6015	Pure Monitor, Luxemburg Milling Co., Luxemburg, Wis.	Linesville, Linesville Coal, Lime and Cement Co.	717	9.96	15.81	14.60
	WHEAT AND RYE OFFALS.					
	Wheat and Rye Middlings.					
5662	Mixed Wheat and Rye White Middlings, Schneider Bros. & Co., Mt. Carmel, Pa.	Mt. Carmel, Schneider Bros. & Co.	460	11.58	15.94	12-16
6108	------ Georg S. Snyder Estate. Hatfield, Pa.	Hatfield, George S. Snyder Est.	810	10.57	14.38	--------
	BUCKWHEAT OFFALS.					
	Buckwheat Middlings.					
6039	------ Acme Milling Co., Corry, Pa.	Corry, Acme Milling Co., --	741	13.72	27.13	--------
6002	------ Sherman Milling Co., Saegertown, Pa.	Saegertown, Sherman Milling Co.	704	15.62	28.75	--------
		Average, -------------	--------	14.67	27.94	--------
	Buckwheat Feed.					
6100	------ The City Mills, Muncy, Pa.	Hatfield, George S. Snyder Estate.	802	10.87	14.94	18.06
	ALFALFA MEAL.					
5827	Ameo, American Milling Co., Chicago, Ill.	Millersburg, Millersburg Roller Milling Co.	56	8.27	14.19	13.00
5740	Briggs' Pure, Clarence S. Briggs, Fowler, Colo.	Lindsey, Lindsey Milling Co.	522	8.40	14.00	12-14
6012	------ The Albert Dickinson Co., Chicago, Ill.	Corry, Acme Milling Co.,--	744	6.55	14.00	12.00
5775	------ The Albert Dickinson Co., Chicago, Ill.	Altoona, Martin & Co.,---	545	7.45	14.13	12.00
6196	------ The Albert Dickinson Co., Chicago, Ill.	Wilmerding, Routh & Co.,	898	6.00	14.06	12.00
6021	Pure The Evergreen Alfalfa Mill, Kearney, Neb.	Erie, D. J. Carroll, -------	723	7.10	16.19	14.00
6078	Pure, The Evergreen Alfalfa Mill, Kearney, Neb.	Lansdale, F. P. Cassel & Son.	780	8.96	18.03	14.00
5343	Great Western, The Great Western Cereal Co., Chicago, Ill.	Mt. Pleasant, J. H. Brown & Son.	141	7.08	14.56	12.00
5531	Great Western, The Great Western Cereal Co., Chicago, Ill.	Emporium, Emporium Milling Co.	329	7.79	14.75	12.00
5809	Lucern Pure, M. C. Peters Mill Co., Omaha, Neb.	Altoona, The Big Diamond Flour and Feed Co.	567	8.74	14.50	11.00
5898	Lucern Pure, M. C. Peters Mill Co., Omaha, Neb.	Oil City, Enterprise Milling Co.	635	7.24	15.50	12.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.50	1.50	4.70	5.20	$30 00	Rye middlings,	As certified,	5913
3.35	1.50	4.72	5.20	28 00	Rye middlings,	As certified,	5354
3.32	--------	4.24	--------	28 00			
3.75	3.40	3.85	3.54	28 00	--------------------------	Rye feed,	6015
4.05	4-6	3.80	5-10	1 50	Wheat and rye middlings,	As certified,	5662
2.65	--------	4.10	--------	1 40	Rye bran, rye middlings, wheat bran and wheat middlings.	As certified,	6108
7.73	--------	3.70	--------	28 00	Buckwheat middlings,	As certified,	6039
7.18	--------	3.52	--------	30 00	Buckwheat middlings,	As certified,	6002
7.46	--------	3.61	--------	29 00			
3.62	4.53	19.67	22.73	27 00	--------------------------	Buckwheat feed.	6100
2.55	2.00	30.72	25.00	1 25	Alfalfa hay,	As certified,	5827
2.20	1.5-2	31.97	31-34	1 40	--------------------------	Alfalfa meal,	5740
1.83	1.00	31.52	35.00	32 00	Made from alfalfa hay,	As certified,	6042
1.63	1.00	30.42	35.00	2 00	Made from alfalfa hay,	As certified,	5775
1.78	1.00	30.35	35.00	1 85	Made from alfalfa hay,	As certified,	6196
2.93	2.00	27.57	20.00	1 30	--------------------------	Alfalfa meal,	6021
3.30	2.00	26.57	20.00	1 50	--------------------------	Alfalfa meal,	6078
2.23	2.00	28.25	30.00	1 50	Made from prime alfalfa meal.	As certified,	5343
2.78	2.00	29.25	30.00	1 40	Made from prime alfalfa meal.	As certified,	5531
2.08	1.00	28.22	33.00	1 75	Ground alfalfa,	As certified,	5809
2.85	0.50	29.55	33.00	2 00	--------------------------	Alfalfa meal,	5898

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5352	"Sameo," The Salina Alfalfa Meal Co., Salina, Kans.	Scottdale, J. E. Pritts, ---	150	7.92	15.06	15.00
5908	Suco, The Sugarine Co., Chicago, Ill.	Millville, M. W. Shoemaker & Son.	70	7.39	14.19	13.00
		Average, -------------	--------	7.60	14.86	--------
5950	Badger Evergreen Feed, Chas. A. Krause Milling Co., Milwaukee, Wis.	Franklin, J. H. Lavery, --	666	19.43	14.61	10.00
5602	Peters Alfal-Fat Sugar Meal, M. C. Peters Mill Co., Omaha, Neb.	Altoona, Central Feed Co.,	400	18.04	14.05	10.00
6111	Shamrock Alfalfa Molasses Feed, The Quaker Oats Co., Chicago, Ill.	Chester, John Thompson,--	813	16.56	13.52	12.00
		Average, -------------	--------	18.01	14.06	--------
	BEET PULP.					
5702	------ German-American Sugar Co., Bay City, Mich.	Indiana, James St. Clair,--	500	7.45	9.44	8.60
5255	------ The Larrowe Milling Co., Detroit, Michigan.	Johnstown, G. Bostert & Son.	755	8.18	8.69	8.00
5997	------ The Larrowe Milling Co., Detroit, Michigan.	Braddock, Braddock Feed Co.	699	8.24	9.31	8.00
5342	------ The Larrowe Milling Co., Detroit, Michigan.	Mt. Pleasant, J. H. Brown & Son.	140	7.77	9.50	8.00
6128	------ The Larrowe Milling Co., Detroit, Michigan.	Ambler, J. Watson Craft,--	830	5.88	10.19	8.00
6062	------ The Larrowe Milling Co., Detroit, Michigan.	Chalfont, F. D. Hartzel's Sons.	764	5.57	9.81	9.00
6085	------ The Larrowe Milling Co., Detroit, Michigan.	West Point, L. W. Mattern.	787	7.70	9.06	8.00
5855	------ The Larrowe Milling Co., Detroit, Michigan.	Washington, Henry O. Myers.	592	8.71	8.94	8.00
5778	------ The Larrowe Milling Co., Detroit, Michigan.	Windber, L. B. Reeser & Co.	548	8.15	9.56	8.00
6099	------ The Larrowe Milling Co., Detroit, Michigan.	Hatfield, George S. Snyder Estate.	801	5.83	10.44	8.00
5259	------ The Larrowe Milling Co., Detroit, Michigan.	Johnstown, Swope Bros.,--	59	8.02	8.63	8.00
5409	------ The Larrowe Milling Co., Detroit, Michigan.	Downingtown, Wells & Walker.	207	8.64	9.31	8.00
6135	------ The Larrowe Milling Co., Detroit, Michigan.	Elizabethtown, E. H. Lemman.	837	6.92	9.67	9.00
5822	------ Michigan Sugar Co., Sebewaing, Mich.	Mechanicsburg, A. B. Harnish.	51	7.75	8.88	8.00
		Average, -------------	--------	7.48	9.39	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.00	2.00	29.85	30.00	$25 00	Pure alfalfa meal,	As certified,	5352
2.00	2.00	29.75	25.00	30 00	Alfalfa hay,	As certified,	5908
2.47	--------	29.53	--------	30 46			
1.83	1.00	13.58	30.00	1 50	Made from alfalfa and syrup.	As certified,	5950
0.69	0.50	13.44	26.00	1 50	Alfalfa and molasses,	As certified,	5602
1.81	1.50	17.49	18.00	1 50	Made from alfalfa and molasses.	As certified,	6111
1.44	--------	14.83	--------	30 00			
1.60	.50	18.15	20.00	1 35	Residue of sugar beets dried after extraction of sugar.	As certified,	5702
1.38	.50	17.70	20.00	28 00	Residue of sugar beets dried after extraction of sugar.	As certified,	5255
1.20	.50	12.55	20.00	1 50	Residue of sugar beets dried after extraction of sugar.	As certified,	5997
1.03	.50	18.52	20.00	25 00	Residue of sugar beets dried after extraction of sugar.	As certified,	5342
0.88	.50	19.85	20.00	1 40	Residue of sugar beets dried after extraction of sugar.	As certified,	6128
0.85	.50	16.50	20.00	25 50	Molasses and residue of sugar beets dried after extraction of sugar.	As certified,	6062
1.95	.50	18.57	20.00	26 00	Molasses and residue of sugar beets dried after extraction of sugar.	As certified,	6085
1.58	.50	18.77	20.00	1 50	Residue of sugar beets dried after extraction of sugar.	As certified,	5855
1.10	.50	18.90	20.00	1 30	Residue of sugar beets dried after extraction of sugar.	As certified,	5778
1.80	.50	17.60	20.00	26 00	Residue of sugar beets dried after extraction of sugar.	As certified,	6099
1.18	.50	18.00	20.00	1 40	Residue of sugar beets dried after extraction of sugar.	As certified,	5259
1.40	.50	19.15	20.00	25 00	Residue of sugar beets dried after extraction of sugar.	As certified,	5409
1.66	.50	17.81	18.00	25 00	Dried beet pulp 90 per cent., beet molasses 10 per cent.	As certified,	6135
1.30	0.50	19.47	20.00	25 50	Residue of sugar beets dried after extraction of sugar.	As certified,	5822
1.35	--------	17.97	--------	26 79			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
	MIXED FEEDS.					
	Proprietary Dairy and Stock Feeds.					
				Per ct.	Per ct.	Per ct.
5525	Acme Feed, Acme Milling Co., Olean, N. Y.	Coudersport, Gates Bros.,	323	8.81	8.44	7.00
5587	Dairy Feed, Altoona Grain and Feed Co., Altoona, Pa.	Altoona, Altoona Grain and Feed Co.	385	10.70	10.06	9.00
5593	Dairy Feed, Altoona Grain and Feed Co., Altoona, Pa.	Altoona, Altoona Grain and Feed Co.	391	9.55	10.75	9.00
		Average,	--------	10.12	10.41	--------
5968	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Manor, Hiram Altman & Son.	670	11.36	16.57	16.50
6056	Sucrene, Dairy Feed, American Milling Co., Chicago, Ill.	Doylestown, Henry S. Beidler.	758	11.95	17.41	16.50
5608	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Williamsport, F. W. Dawson & Son.	406	9.46	17.12	16.50
5917	Sucrene, Dairy Feed, American Milling Co., Chicago, Ill.	McKeesport, A Davidson, --	645	13.21	15.96	16.50
5786	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Somerset, John G. Emert,	556	11.78	16.36	16.50
5279	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Lancaster, Esbenshade & Co.	77	11.63	14.94	16.50

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.20	3.00	7.10	9.00	$1 20	Corn, hominy and oat hulls.	As certified,	5525
5.60	4.00	6.00	9.00	1 50	Corn chop, bran, alfalfa, hominy feed and oil meal.	As certified.	5587
6.33	4.00	7.60	9.00	30 00	Corn chop, bran, hominy feed and oil meal.	Corn chop, wheat bran, hominy feed, oil meal, alfalfa meal, oats, oat middlings and oat hulls.	5593
5.97	--------	6.80	--------	30 00			
4.39	3.50	11.94	12.00	25 00	Cottonseed meal, gluten feed, molasses, oat clippings and mixed broken grains from wheat, oat and barley screenings and ½ of 1 per cent. salt.	As certified,	5968
6.30	3.50	11.07	12.00	26 00	Cottonseed meal, gluten feed, molasses, oat clippings and mixed broken grains from wheat, oat and barley screenings and ½ of 1 per cent. salt.	As certified,	6056
4.72	3.50	11.75	12.00	1 25	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified,	5608
4.51	3.50	12.54	12.00	26 00	Cottonseed meal, gluten feed, molasses, oat clippings and mixed broken grains from wheat, oat and barley screenings and ½ of 1 per cent. salt.	As certified.	5917
4.26	3.50	13.45	12.00	27 00	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings, a small amount of weed seeds and ½ of 1 per cent. salt.	5786
3.84	3.50	11.30	12.00	25 00	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings, a small amount of weed seeds and ½ of 1 per cent. salt.	5279

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
5289	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Lancaster, John W. Eshelman.	87	11.16	17.06	16.50
5687	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Monongahela, D. E. Gamble.	485	11.75	17.32	16.50
5382	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	York, A. F. Gross & Son,	180	11.12	15.71	16.50
5664	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Sunbury, Kift Milling Co.,	462	10.36	17.02	16.50
6012	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Linesville, Linesville Coal, Lime and Cement Co.	714	9.33	18.43	16.50
6144	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Rohrerstown, Miller & Bushong.	846	13.39	16.68	16.50
5312	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Manheim, F. K. Nauman,--	110	11.82	15.91	16.50
5954	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Orefield, W. B. Newhard & Co.	83	9.96	16.56	16.50

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.78	3.50	7.17	12.00	$24 50	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings, a small amount of weed seeds and ½ of 1 per cent. salt.	5289
5.41	3.50	12.48	12.00	26 00	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings, a small amount of weed seeds and ½ of 1 per cent. salt.	5687
4.98	3.50	11.02	12.00	1 30	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings, a small amount of weed seeds and ½ of 1 per cent. salt.	5382
4.94	3.50	11.96	12.00	26 00	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings, a small amount of weed seeds and ½ of 1 per cent. salt.	5664
6.10	3.50	11.17	12.00	24 00	Cottonseed meal, gluten feed, oats, barley, wheat, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified, ...	6012
4.34	3.50	12.02	12.00	25 50	Cottonseed meal, gluten feed, molasses, oat clippings and mixed broken grains from wheat, oat and barley screenings and ½ of 1 per cent. salt.	As certified, ...	6144
7.00	3.50	12.83	12.00	26 00	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified, ...	5312
3.89	3.50	13.17	12.00	26 00	Cottonseed meal, gluten feed, molasses, oat clippings and mixed broken grains from wheat, oat and barley screenings and ½ of 1 per cent. salt.	As certified, ...	5954

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5925	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Allentown, George B. Shelly,	72	12.04	17.04	16.50
5826	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Halifax, A. M. Smith, ---	55	11.04	16.43	16.50
5636	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Troy, Snedeker & Mitchell,	434	12.00	17.20	16.50
5714	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	New Castle, P. Wagner & Son.	512	12.11	15.60	16.50
5910	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Irwin, T. F. Wilson Co.,--	638	12.54	16.69	16.50
5241	Sucrene Dairy Feed, American Milling Co., Chicago, Ill.	Prescott, Ephraim Zug, ---	41	11.91	15.70	16.50
		Average, -------------	--------	11.49	16.56	--------
5670	Sucrene Mixing Feed, American Milling Co., Chicago, Ill.	Sunbury, Kift Milling Co.,	468	9.26	12.23	10.00
5288	Sucrene Quality Feed, American Milling Co., Chicago, Ill.	Lancaster, John W. Eshelman.	86	11.02	21.01	20.00
5383	Sucrene Stock Feed, American Milling Co., Chicago, Ill.	York, A. F. Gross & Son,	181	9.72	10.19	10.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.30	3.50	11.51	12.00	$27 00	Cottonseed meal, gluten feed, oats, barley, wheat, molasses and mixed broken grains from wheat, oat, buckwheat, oat and barley screenings and ½ of 1 per cent. salt.	As certified,	5925
5.14	3.50	13.14	12.00	1 25	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oats, buckwheat and barley screenings, a small amount of weed seeds and ½ of 1 per cent. salt.	5820
5.50	3.50	11.83	12.00	25 00	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified,	5636
5.05	3.50	10.81	12.00	26 00	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oats, buckwheat and barley screenings, chaff, weed seeds and ½ of 1 per cent. salt.	5714
4.53	3.50	11.78	12.00	25 00	Cottonseed meal, gluten feed, oats, barley, wheat, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified,	5910
6.54	3.50	12.99	12.00	24 00	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified,	5241
5.03	....	11.78	....	25 50			
4.84	2.00	16.15	12.00	1 20	Oats, barley, wheat, malt sprouts, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified,	5670
4.34	4.00	10.82	10.00	27 00	Cottonseed meal, dried grains, oats, barley, wheat, malt sprouts, molasses and ½ of 1 per cent. salt.	As certified,	5288
3.68	3.50	8.60	13.50	1 45	Corn, oats, barley, wheat, buckwheat, linseed meal and ½ of 1 per cent. salt.	As certified,	5383

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6025	Ubiko Union Grains, Biles Ready Dairy Rations, The J. W. Biles Co., Cincinnati, Ohio.	Erie, A. P. Allen, ...	727	7.34	24.69	24.00
5644	Ubiko Union Grains, Biles Ready Dairy Rations, The J. W. Biles Co., Cincinnati, Ohio.	Wellsboro, George C. and F. A. Brooks.	442	7.87	24.75	24.00
5508	Ubiko Union Grains, Biles Ready Dairy Rations, The J. W. Biles Co., Cincinnati, Ohio.	Bradford, L. A. Fischer & Co.	306	7.25	25.38	24.00
5437	Ubiko Union Grains, Biles Ready Dairy Rations, The J. W. Biles Co., Cincinnati, Ohio.	Beaver Falls, M. W. McCandless.	235	6.33	25.50	24.00
5526	Ubiko Union Grains, Biles Ready Dairy Rations, The J. W. Biles Co., Cincinnati, Ohio.	Emporium, E. J. Rogers,	324	7.33	25.44	24 00
5704	Ubiko Union Grains, Biles Ready Dairy Rations, The J. W. Biles Co., Cincinnati, Ohio.	Indiana, St. Clair, Rinn & Co.	502	7.45	25.38	24.00
5933	Ubiko Union Grains, Biles Ready Dairy Rations, The J. W. Biles Co., Cincinnati, Ohio.	South Bethlehem, C. C. Lynn & Co.	80	6.75	26.06	24.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
8.40	7.00	9.10	9.00	$31 00	Fourex distillers' dried grains, choice cottonseed meal, old process linseed meal, white wheat middlings, winter wheat bran, hominy meal, brewers' dried grains, barley, malt sprouts and ¾ of 1 per cent. salt.	As certified.	6025
8.00	7.00	9.05	9.00	28 50	Fourex distillers' dried grains, choice cottonseed meal, old process linseed meal, white wheat middlings, winter wheat bran, hominy meal, barley, malt sprouts and ¾ of 1 per cent. salt.	As certified.	5644
8.50	7.00	9.30	9.00	1 65	Fourex distillers' dried grains, choice cottonseed meal, old process linseed meal, white wheat middlings, winter wheat bran, hominy meal, barley, malt sprouts and ¾ of 1 per cent. salt.	As certified.	5508
8.90	7.00	9.27	9.00	31 00	Fourex distillers' dried grains, choice cottonseed meal, old process linseed meal, white wheat middlings, winter wheat bran, hominy meal, brewers' dried grains, barley, malt sprouts and ¾ of 1 per cent. salt.	As certified.	5437
7.95	7.00	9.00	9.00	1 70	Fourex distillers' dried grains, choice cottonseed meal, old process linseed meal, white wheat middlings, winter wheat bran, hominy meal, brewers' dried grains, barley, malt sprouts and ¾ of 1 per cent. salt.	As certified.	5526
8.80	7.00	9.45	9.00	28 00	Fourex distillers' dried grains, choice cottonseed meal, old process linseed meal, white wheat middlings, winter wheat bran, hominy meal, barley, malt sprouts and ¾ of 1 per cent. salt.	As certified.	5704
8.20	7.00	9.20	9.00	32 00	Fourex distillers' dried grains, choice cottonseed meal, old process linseed meal, white wheat middlings, winter wheat bran, hominy meal, brewers' dried grains, barley, malt sprouts and ¾ of 1 per cent. salt.	As certified.	5933

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
5407	Ubiko Union Grains, Biles Ready Dairy Rations, The J. W. Biles Co., Cincinnati, Ohio.	Downingtown, Wells & Walker.	205	8.59	25.69	24.00
		Average,		7.36	25.36	
5631	Unicorn Dairy Ration, Chapin & Co., Buffalo, N. Y.	Troy, Austin Leonard,	429	7.45	27.31	26.00
5646	Unicorn Dairy Ration, Chapin & Co., Buffalo, N. Y.	Westfield, H. Z. Pride & Son.	444	8.12	26.81	26.00
5974	Unicorn Dairy Ration, Chapin & Co., Buffalo, N. Y.	Pittsburg, The I. W. Scott Co.	676	7.28	27.88	26.00
5733	Unicorn Dairy Ration, Chapin & Co., Buffalo, N. Y.	Wysox, Smith & Waldo,	10	8.23	25.75	26.00
		Average,		7.77	26.94	
5518	Chesbro's Stock Feed, Chesbro Milling Co., Salamanca, N. Y.	Bradford, Smith Bros.,	316	8.32	10.75	10-12
6186	White Cross Stock Feed, The Albert Dickinson Co., Chicago, Ill.	Wilmerding, Routh & Co.,	888	10.92	10.19	10.00
5897	Duffee's Mixed Feed, Clyde D. Duffee, Oil City. Pa.	Oil City, Clyde D. Duffee,	634	10.06	13.44	11-13
5957	Crystaloid Dairy Feed, Jonas F. Eby & Son, Lancaster, Pa.	Mertztown, D. W. Delong,	86	8.40	17.63	16.50
5423	Crystaloid Dairy Feed, Jonas F. Eby & Son, Lancaster, Pa.	Coatesville, T. J. Gay & Son.	221	11.03	16.78	16.50
		Average,		9.71	17.21	

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
7.80	7.00	9.75	9.00	$32 00	Fourex distillers dried grains, choice cottonseed meal, old process linseed meal, white wheat middlings, winter wheat bran, hominy meal, brewers' dried grains, barley, malt sprouts and ¾ of 1 per cent. salt.	As certified,	5407
8.32	--------	9.26	--------	31 19			
6.08	5.5–6.5	9.60	9.00	1 40	Distillers' feed, green diamond cottonseed meal, green diamond hominy, wheat or corn, gluten feed, barley feed, sprouts and pure wheat bran.	As certified,	5631
6.40	5.5–6.5	9.60	9–10	31 00	Distillers' feed, green diamond cottonseed meal, green diamond hominy, wheat or corn, gluten feed, barley feed, sprouts and pure wheat bran.	As certified,	5646
7.68	5.5–6.5	9.67	9–10	33 00	Distillers' feed, green diamond cottonseed meal, green diamond hominy, corn, gluten feed, barley feed, sprouts, brewers' grains and pure wheat bran.	As certified,	5974
6.68	5.5–6.5	8.72	9–10	30 00	----------------------------	Distillers' grains, cottonseed meal, hominy meal, gluten feed, malt sprouts and wheat bran.	5733
6.71	--------	9.39	--------	30 50			
4.85	3.25–4.5	7.20	7–9	1 35	Corn, barley, cottonseed meal, oat shorts, oat middlings, oat hulls and ½ of 1 per cent. salt.	As certified,	5518
4.58	3.50	4.85	10.00	1 75	Corn, oats, barley, wheat meal and ½ of 1 per cent. salt.	As certified,	6186
4.45	3–4	4.15	5–7	1 60	Corn meal, middlings and bran.	As certified,	5897
4.98	3.50	12.61	12.00	20 00	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified,	5957
4.75	3.50	11.90	12.00	1 30	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses and mixed broken grains wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified,	5423
4.87	--------	12.25	--------	23 00			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6151	Elba Cotton Seed Feed, Elba Manufacturing Co., Charlotte, N. C.	Quarryville, Lancaster County Farmers' Association.	853	9.35	13.06	8.00
5768	Empire Feed, Empire Mills, Olean, N. Y.	Penfield, Penfield Supply Co.	538	9.61	9.38	7.5–9
5528	Emporium Feed, Emporium Milling Co., Emporium, Pa.	Emporium, C. B. Howard & Co.	326	9.04	11.00	7.63
5515	Faramel Dairy Feed, Faramel Manufacturing Co., Buffalo, N. Y.	Bradford, Smith Bros., ---	313	14.29	16.37	16.63
6160	Sugar Ring Feed, F. W. Goeke & Co., St. Louis, Mo.	Lewistown, H. C. Jackson,	862	10.09	12.97	11–13
6159	Holstein Sugar Feed, F. W. Goeke & Co., St. Louis, Mo.	Lewistown, H. C. Jackson,	861	6.33	15.56	15.00
5346	Boss Feed, The Great Western Cereal Co., Chicago, Ill.	Mt. Pleasant, J. H. Brown & Son.	144	10.82	9.44	8.00
5424	Boss Feed, The Great Western Cereal Co., Chicago, Ill.	Coatesville, T. Gay & Son,	222	10.00	8.69	8.00
5815	Boss Feed, The Great Western Cereal Co., Chicago, Ill.	Longsdorf, James P. Myers,	44	9.26	8.94	8.00
5830	Boss Feed, The Great Western Cereal Co., Chicago, Ill.	Elizabethville, J. A. Romberger.	59	9.94	9.06	8.00
5821	Boss Feed, The Great Western Cereal Co., Chicago, Ill.	Ephrata, S. M. Seldomridge.	119	9.50	8.44	8.00
5825	Boss Feed, The Great Western Cereal Co., Chicago, Ill.	Shippensburg, Wadle & Deal.	54	8.81	10.13	8.00
5240	Boss Feed, The Great Western Cereal Co., Chicago, Ill.	Prescott, Ephraim Zugg, --	40	9.26	8.81	8.00
		Average, --------------	--------	9.65	9.07	--------
5530	Daisy Dairy Feed, The Great Western Cereal Co., Chicago, Ill.	Emporium, Emporium Milling Co.	328	8.94	15.29	15.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
2.40	2.50	33.70	40.00	$17 25	Cottonseed meal and cottonseed hulls.	As certified, ----------	6151
2.98	3–5	5.38	9.00	1 50	Corn, hominy and oat hulls.	As certified, ----------	5768
4.73	2.97	5.20	9.00	1 30	Corn, hominy, oats, oat hulls and oat middlings.	As certified, ----------	5528
4.11	4.45	6.88	7.02	1 50	Gluten, malt sprouts, wheat bran, corn meal and molasses.	As certified, ----------	5515
3.53	4.00	11.73	12.00	26 00	Wheat, corn, oats, barley, alfalfa meal, rice bran, screenings and molasses.	As certified, ----------	6160
3.76	3.00	15.91	15.00	26 00	Molasses, wheat, corn, oats, barley, cottonseed meal, malt sprouts, alfalfa meal, screenings and salt.	As certified, ----------	6159
5.03	3.50	8.22	9.00	1 30	Corn, hominy feed, oats, oat middlings, oat hulls and oat shorts. Maximum salt ¾ of 1 per cent.	As certified, ----------	5346
3.75	3.50	9.20	9.00	1 30	Corn, hominy feed, oats, oat middlings, oat hulls and oat shorts. Maximum salt ¾ of 1 per cent.	As certified, ----------	5424
4.00	3.50	7.92	9.00	24 00	Corn, hominy feed, oats, oat middlings, oat hulls and oat shorts. Maximum salt ¾ of 1 per cent.	As certified, ----------	5815
3.73	3.50	6.70	9.00	25 00	Corn, hominy feed, oats, oat middlings, oat hulls and oat shorts. Maximum salt ¾ of 1 per cent.	As certified, ----------	5830
4.58	3.50	7.42	9.00	24 00	Corn, hominy feed, oats, oat middlings, oat hulls and oat shorts. Maximum salt ¾ of 1 per cent.	As certified, ----------	5321
5.70	3.50	7.90	9.00	28 00	Corn, hominy feed, oats, oat middlings, oat hulls and oat shorts. Maximum salt ¾ of 1 per cent.	As certified, ----------	5825
5.00	3.50	7.77	9.00	22 00	Corn, hominy feed, oats, oat middlings, oat hulls and oat shorts. Maximum salt ¾ of 1 per cent.	As certified, ----------	5240
4.54	--------	7.87	--------	25 00			
3.24	3.00	13.47	12.00	1 40	Oats, cottonseed meal, alfalfa meal, oat middlings, mixed broken grains from barley, oats, rye, etc., with N. O. molasses. Maximum salt ¾ of 1 per cent.	Cottonseed meal, oats, alfalfa meal, barley, rye, oat middlings, a large proportion of oat hulls, molasses and ¾ of 1 per cent. salt.	5530

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
5772	Sterling Feed, The Great Western Cereal Co., Chicago, Ill.	Tyrone, Albright Bros., --	542	Per ct. 8.75	Per ct. 11.50	Per ct. 10.00
5434	Sterling Feed, The Great Western Cereal Co., Chicago, Ill.	Pittsburg, S. B. Floyd & Son.	232	10.79	10.81	10.00
5329	Sterling Feed, The Great Western Cereal Co., Chicago, Ill.	Latrobe, K. & L. Golde, --	127	10.88	11.00	10.00
5573	Sterling Feed, The Great Western Cereal Co., Chicago, Ill.	Philipsburg, Philipsburg Grist Mill.	371	9.47	10.63	10.00
5803	Sterling Feed, The Great Western Cereal Co., Chicago, Ill.	Shillington, J. P. Reeser, --	39	9.43	11.69	10.00
5829	Sterling Feed, The Great Western Cereal Co., Chicago, Ill.	Elizabethville, J. A. Romberger.	58	9.05	9.63	10.00
5783	Sterling Feed, The Great Western Cereal Co., Chicago, Ill.	Somerset, Saylor & Woy,--	553	8.95	11.50	10.00
5824	Sterling Feed, The Great Western Cereal Co., Chicago, Ill.	Shippensburg, Wadle & Deal.	53	9.09	10.44	10.00
		Average, ----------	--------	9.55	10.90	--------
5345	Sterling Stock Feed, The Great Western Cereal Co., Chicago, Ill.	Mt. Pleasant, J. H. Brown & Son.	143	10.20	11.13	10.00
5616	Sterling Stock Feed, The Great Western Cereal Co., Chicago, Ill.	Williamsport, M. E. Donnel & Co.	414	9.18	10.44	10.00
5468	Sterling Stock Feed, The Great Western Cereal Co., Chicago, Ill.	Kittanning, William Gates Estate.	266	9.94	10.50	10.00
		Average, ----------	--------	9.77	10.69	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.00	4.00	9.22	9.00	$29 00	Corn, oats, barley, cottonseed meal, red dog flour, oat meal mill by-products (oat middlings, oat hulls and oat shorts). Maximum salt ¾ of 1 per cent.	As certified,	5772
4.00	4.00	7.42	9.00	23 00	Corn, oats, barley, cottonseed meal, red dog flour, oat shorts, oat hulls and oat middlings. Maximum salt ¾ of 1 per cent.	As certified,	5434
3.75	4.00	7.20	9.00	25 00	Corn, oats, barley, cottonseed meal, red dog flour, oat shorts, oat hulls and oat middlings. Maximum salt ¾ of 1 per cent.	As certified,	5329
4.13	4.00	6.65	9.00	26 00	Corn, oats, barley, cottonseed meal, red dog flour, oat shorts, oat hulls and oat middlings. Maximum salt ¾ of 1 per cent.	As certified,	5573
3.08	4.00	7.05	9.00	28 00	Corn, oats, barley, cottonseed meal, red dog flour, oat shorts, oat hulls and oat middlings. Maximum salt ¾ of 1 per cent.	As certified,	5803
3.10	4.00	8.05	9.00	26 00	Corn, oats, barley, cottonseed meal, red dog flour, oat shorts, oat hulls and oat middlings. Maximum salt ¾ of 1 per cent.	As certified,	5829
3.53	4.00	8.92	9.00	1 50	Corn, oats, barley, cottonseed meal, red dog flour, oat shorts, oat hulls and oat middlings. Maximum salt ¾ of 1 per cent.	As certified,	5783
3.33	4.00	6.27	9.00	30 00	Corn, oats, barley, cottonseed meal, red dog flour, oat meal mill by-products (oat middlings, oat hulls and oat shorts). Maximum salt ¾ of 1 per cent.	As certified,	5824
3.62	--------	7.59	--------	27 13			
4.25	4.00	8.52	9.00	25 00	Corn, oats, barley, cottonseed meal, red dog flour, oat shorts and oat hulls. Maximum salt ¾ of 1 per cent.	As certified,	5345
4.90	4.00	6.45	9.00	1 35	Corn, oats, barley, cottonseed meal, red dog flour, oat shorts and oat hulls. Maximum salt ¾ of 1 per cent.	As certified.	5616
4.00	4.00	8.17	9.00	1 20	Corn, oats, barley, cottonseed meal, red dog flour, oat shorts and oat hulls. Maximum salt ¾ of 1 per cent.	As certified,	5468
4.38	--------	7.71	--------	25 33			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5584	H. & S. Alfalfa Feed, Dwight E. Hamlin & Co., Pittsburg, Pa.	Osceola, Brown, Baird & Reeve.	382	16.19	20.66	16.00
5847	H. & S. Alfalfa Feed, Dwight E. Hamlin & Co., Pittsburg, Pa.	Washington, C. B. Rueh,	584	10.79	13.11	12.00
6066	Husted Molasses Feed, Husted Milling Co., Buffalo, N. Y.	Colmar, C. R. Rosenberger,	768	11.72	22.97	18-20
5632	Husted Molasses Feed, Husted Milling Co., Buffalo, N. Y.	Troy, Snedeker & Mitchell,	430	12.10	20.56	18-20
5630	Husted Molasses Feed, Husted Milling Co., Buffalo, N. Y.	Troy, H. M. Spalding & Son.	428	12.84	21.59	18-20
		Average,		12.22	21.71	
5320	Mayflower Stock Feed, Husted Milling Co., Buffalo, N. Y.	Lititz, Elmer Eby,	118	10.06	9.81	7.5-9
5696	Imperial Feed Meal, The Imperial Grain and Milling Co., Toledo, Ohio.	Blairsville, George J. New,	494	10.18	8.56	7.00
5700	International Dairy Feed, International Sugar Feed Minneapolis, Minn.	Homer City, A. George & Son.	498	11.70	18.71	16.50
5473	International Dairy Feed, International Sugar Feed Minneapolis, Minn.	Parnassus, Johnston & Hamilton.	271	11.88	17.15	16.50
6180	International Dairy Feed, International Sugar Feed Minneapolis, Minn.	Jeannette, Keystone Supply Co.	882	12.72	16.14	16.50
5353	International Dairy Feed, International Sugar Feed Minneapolis, Minn.	Uniontown, King Bros.,	151	11.37	17.00	16.50
5380	International Dairy Feed, International Sugar Feed Minneapolis, Minn.	Charleroi, R. C. Mountser,	178	11.41	18.10	16.50
		Average,		11.81	17.42	

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.44	3.50	15.42	16.00	32 00	Alfalfa, molasses and brewers' grains.	As certified, ...	5584
3.62	3.50	8.62	10.00	36 00	Alfalfa, corn, dried grains and molasses.	As certified, ...	5847
5.11	4-6	9.27	8-9	28 00	Cottonseed meal, gluten, oat clippings, corn, oil meal, distillers' grains, molasses and ¾ of 1 per cent. salt.	As certified, ...	6066
5.11	4-6	8.37	8-9	1 40	Cottonseed meal, gluten, oat clippings, corn, oil meal, molasses and ¾ of 1 per cent. salt.	As certified.	5632
5.76	4-6	7.94	8-9	1 35	Cottonseed meal, gluten, oat clippings, corn, oil meal, distillers' grains, molasses and ¾ of 1 per cent. salt.	As certified, ...	5630
5.33	....	8.52	....	27 67			
5.80	3.5-4.5	6.67	7-9	24 50	Corn, oats, oat hulls and ¾ of 1 per cent. salt.	As certified, ...	5320
3.70	2.50	5.65	9.00	25 00	Ear corn and ½ of 1 per cent. salt.	As certified, ...	5696
6.35	3.50	12.73	12.00	25 00	Cottonseed meal, molasses, mixed broken grains of cereal plants, separated from wheat, oats, barley and flax screenings, oat clips and salt.	Cottonseed meal, molasses, mixed broken grains of cereal plants separated from wheat, oats, barley and flax screenings, a large amount of weed seeds, chaff, oat clips and salt.	5700
5.59	3.50	13.44	12.00	29 00	Cottonseed meal, molasses, mixed broken grains of cereal plants, separated from wheat, oats, barley and flax screenings, oat clips and salt.	Cottonseed meal, molasses, mixed broken grains of cereal plants separated from wheat, oats, barley and flax screenings, a small amount of weed seeds and chaff and salt.	5473
5.34	3.50	11.75	12.00	28 00	Cottonseed meal, molasses, mixed broken grains of cereal plants, separated from wheat, oats, barley and flax screenings, oat clips and salt.	As certified, ...	6180
5.03	3.50	14.07	12.00	29 00	Cottonseed meal, molasses, mixed broken grains, including wheat, oats, barley, buckwheat, flax, oat clips and salt.	As certified, ...	5353
5.40	3.50	12.44	12.00	29 00	Cottonseed meal, molasses, mixed broken grains, including wheat, oats, barley, buckwheat, flax, oat clips and salt.	As certified, ...	5380
5.54	....	**12.88**	....	**28 00**			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5859	International Molasses Feed, International Sugar Feed Co., Minneapolis, Minn.	Canonsburg, Canonsburg Milling Co.	596	7.63	13.11	10.00
5860	International Special Molasses Feed, International Sugar Feed Co., Minneapolis, Minn.	Canonsburg, Canonsburg Milling Co.	597	7.47	15.13	12.50
5699	International Special Molasses Feed, International Sugar Feed Co., Minneapolis, Minn.	Homer City, A. George & Son.	497	11.77	13.42	12.50
6179	International Special Molassess Feed, International Sugar Feed Co., Minneapolis, Minn.	Jeannette, Keystone Supply Co.	881	11.36	15.53	12.50
		Average. -------------	--------	10.20	14.69	--------
5273	Kornfalfa Feed, Kornfalfa Feed Milling Co., Kansas City, Mo.	Butler, H. J. Klingler & Co.	71	9.18	11.00	11.00
6198	Kornfalfa Feed, Kornfalfa Feed Milling Co., Kansas City, Mo.	Pittsburg, Daniel McCaffrey's Sons Co.	900	8.64	11.50	10.00
6118	Kornfalfa Feed, Kornfalfa Feed Milling Co., Kansas City, Mo.	Chester, T. Frank McCall,	820	9.12	11.81	10.00
		Average, -------------	--------	8.98	11.44	--------
6027	Badger Dairy Feed, Chas. A. Krause Milling Co., Milwaukee, Wis.	Erie, A. P. Allen, ---------	729	13.43	19.22	16.00
5964	Badger Dairy Feed, Chas. A. Krause Milling Co., Milwaukee, Wis.	Green Lane, Frank Barndt,	93	13.40	19.50	16.00
6149	Badger Dairy Feed, Chas. A. Krause Milling Co., Milwaukee, Wis.	Quarryville, S. Book & Bro.	851	15.29	17.15	16.00
6104	Badger Dairy Feed, Chas. A. Krause Milling Co., Milwaukee, Wis.	Hatfield, George S. Snyder Estate.	806	14.72	17.45	16.00
5872	Badger Dairy Feed, Chas. A. Krause Milling Co., Milwaukee, Wis.	Huntingdon, J. Stouffer, --	609	14.13	16.43	16.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct				
5.24	3.50	12.24	12.00	$22 00	Molasses, mixed broken grains of cereal plants, separated from wheat, oats, barley and flax screenings, oat clips and salt.	As certified, ----------	5859
5.66	3.50	12.22	12.00	24 00	Cottonseed meal, molasses, mixed broken grains of cereal plants, separated from wheat, oats, barley and flax screenings, oat clips salt.	As certified, ----------	5860
6.12	3.50	14.88	12.00	23 00	Cottonseed meal, molasses, mixed broken grains of cereal plants, separated from wheat, oats, barley and flax screenings, oat clips salt.	Cottonseed meal, molasses, mixed broken grains of cereal plants separated from wheat, oats, barley and flax screenings oat clips, large amount of weed seeds, chaff and salt.	5699
5.44	3.50	12.59	12.00	26 00	Cottonseed meal, molasses, mixed broken grains of cereal plants, separated from wheat, oats, barley and flax screenings, oat clips salt.	As certified, ----------	6179
5.74	--------	13.23	--------	24 33			
3.80	4.00	10.85	12.00	1 60	Alfalfa, corn and oats,--	As certified, ----------	5273
3.60	3.50	12.15	12.00	1 75	Alfalfa, corn and oats,--	As certified, ----------	6198
4.05	3.50	12.57	12.00	35 00	Alfalfa, corn and oats,--	As certified, ----------	6118
3.82	--------	11.85	--------	34 00			
3.84	2.00	11.89	15.00	27 00	Cottonseed meal, corn oil meal, malt sprouts, dried grains, alfalfa meal, molasses and ¼ of 1 per cent. salt.	As certified, ----------	6027
3.82	2.00	11.61	15.00	1 30	Cottonseed meal, corn oil meal, malt sprouts, dried grains, alfalfa meal, molasses and ¼ of 1 per cent. salt.	As certified, ----------	5964
4.24	2.00	11.10	15.00	25 00	Cottonseed meal, corn oil meal, malt sprouts, dried grains, alfalfa meal; molasses and ¼ of 1 per cent. salt.	As certified, ----------	6149
2.84	2.00	11.66	15.00	26 00	Cottonseed meal, corn oil meal, dried grains, malt sprouts, alfalfa meal, molasses and ¼ of 1 per cent. salt.	As certified, ----------	6104
4.76	2.00	10.47	15.00	27 00	Cottonseed meal, corn oil meal, malt sprouts, dried grains, alfalfa meal, molasses and ¼ of 1 per cent. salt.	As certified. ----------	5872

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5799	Badger Dairy Feed, Chas. A. Krause Milling Co., Milwaukee, Wis.	Hamburg, Union Roller Mills.	35	12.68	19.11	16.00
		Average,		13.94	18.14	
5410	Badger Dairy Feed, The Perfect Balanced Ration, Chas. A. Krause Milling Co., Milwaukee, Wis.	West Grove, S. K. Chambers & Bro.	208	15.36	15.92	16.00
5650	Badger Dairy Feed, The Perfect Balanced Ration, Chas. A. Krause Milling Co., Milwaukee, Wis.	Knoxville, Deerfield Milling Co.	448	11.16	17.54	16-18
5494	Badger Dairy Feed, The Perfect Balanced Ration, Chas. A. Krause Milling Co., Milwaukee, Wis.	St. Marys, L. Ritter,	292	17.13	17.11	16.00
5386	Badger Dairy Feed, The Perfect Balanced Ration, Chas. A. Krause Milling Co., Milwaukee, Wis.	York, H. H. Smyser,	184	14.82	15.95	16.00
5623	Badger Dairy Feed, The Perfect Balanced Ration, Chas. A. Krause Milling Co., Milwaukee, Wis.	Williamsport, John T. Stahlnecker.	421	12.80	16.34	16.00
5234	Badger Dairy Feed, The Perfect Balanced Ration, Chas. A. Krause Milling Co., Milwaukee, Wis.	Palmyra, A. S. Stauffer,	34	10.96	17.60	16-18
5416	Badger Dairy Feed, The Perfect Balanced Ration, Chas. A. Krause Milling Co., Milwaukee, Wis.	Kennett Square, W. H. Walker & Bro.	214	14.70	17.75	16.00
		Average,		13.84	16.89	
5673	McMahan's Concentrated Protein Feed, C. H. McMahan, Milton, Pa.	Milton, C. H. McMahan,	471	7.28	32.31	28-30
5676	Milk and Muscle Producer, C. H. McMahan, Milton, Pa.	Milton, C. H. McMahan,	474	7.40	26.31	23-25
5671	Special Pig Grower, C. H. McMahan, Milton, Pa.	Milton, C. H. McMahan,	469	8.79	16.63	15-15.87

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
6.52	2.00	9.25	15.00	$25 00	Cottonseed meal, corn oil meal, malt sprouts. dried grains, alfalfa meal, molasses and ¼ of 1 per cent. salt.	As certified, ...	5799
4.34	....	10.99	....	26 00			
2.77	2.00	14.72	15.00	27 00	Cottonseed meal, dried grains, malt sprouts, alfalfa meal, molasses and ¼ of 1 per cent. salt.	As certified, ...	5410
5.10	3.5–4.5	14.87	14.00	1 30	Cottonseed meal, distillers' grains, brewers' grains, malt sprouts, corn. oats, barley, low grade wheat, alfalfa meal. molasses and ¼ of 1 per cent. salt.	Cottonseed meal, distillers' grains, brewers' grains, malt sprouts, corn, oats, barley, low grade wheat, alfalfa meal, small amount of weed seeds, molasses and ¼ of 1 per cent. salt.	5650
2.59	2.00	11.93	15.00	1 40	Cottonseed meal, dried grains, malt sprouts, alfalfa meal, molasses and ¼ of 1 per cent. salt.	As certified, ...	5494
2.99	2.00	12.75	15.00	23 00	Cottonseed meal. dried grains, malt sprouts, alfalfa meal, molasses and ¼ of 1 per cent. salt.	As certified, ...	5386
2.23	2.00	14.79	15.00	1 25	Cottonseed meal, dried grains. malt sprouts. alfalfa meal, molasses and ¼ of 1 per cent. salt.	As certified, ...	5623
6.46	3.5–4.5	9.97	14.00	25 00	Cottonseed meal. dried grains, malt sprouts, corn, wheat. alfalfa. grain screenings, molasses and ¼ of 1 per cent. salt.	Cottonseed meal, dried brewers' grains, malt sprouts, corn, wheat, alfalfa, grain screenings, small amount of weed seeds, molasses and ¼ of 1 per cent. salt.	5234
2.24	2.00	14.30	15.00	26 00	Cottonseed meal. dried grains. malt sprouts, alfalfa meal, molasses and ¼ of 1 per cent. salt.	As certified, ...	5416
3.48	....	13.39	....	25 71			
7.02	7–8	12.52	11–11.5	30 00	Brewers' dried grains. malt sprouts and cottonseed meal.	As certified.	5673
6.60	7–9	10.47	10–11	28 00	Brewers' dried grains, malt sprouts. cottonseed meal and hominy meal.	As certified, ...	5676
7.90	8–8.5	7.25	6–7	1 40	Brewers' dried grains, malt sprouts, cottonseed meal and hominy meal.	As certified, ...	5671

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5280	Sugarota Dairy Feed, North-West Mills Co., Winona, Minn.	Lancaster, Esbenshade & Co.	78	11.98	16.00	16.50
5405	Sugarota Dairy Feed, North-West Mills Co., Winona, Minn.	Spring Forge, Menges Bros. & Stauffer.	203	11.33	15.98	16.50
5765	Sugarota Dairy Feed, North-West Mills Co., Winona, Minn.	Stroudsburg, W. H. Montz & Son.	28	9.74	16.87	16–18
5297	Sugarota Dairy Feed, North-West Mills Co., Winona, Minn.	Lancaster, Sprecher & Ganss.	95	11.30	15.61	16.50
5237	Sugarota Dairy Feed, North-West Mills Co., Winona, Minn.	Palmyra, A. S. Stauffer, --	37	11.19	15.40	16.50
5222	Sugarota Dairy Feed, North-West Mills Co., Winona, Minn.	Lebanon, A. M. Weltmer's Sons.	22	11.43	14.89	16.50
		Average, --------------	--------	11.16	15.79	--------
5975	Otto Weiss Alfalfa Oats Food, The Otto Weiss Alfalfa Stock Food Co., Wichita, Kan.	Pittsburg, The I. W. Scott Co.	677	8.34	15.06	12.00
5922	Otto Weiss Alfalfa Oats Food, The Otto Weiss Alfalfa Stock Food Co., Wichita, Kan.	Carnegie, C. A. Foster, ---	650	9.25	13.13	11.00
		Average, --------------	--------	**8.79**	**14.10**	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.60	3.50	13.23	14.00	$25 00	Cottonseed meal, malt sprouts, mixed broken grains from screenings containing wheat, barley, oats, corn, flax and molasses and small per cent. of salt.	Cottonseed meal, malt sprouts, mixed broken grains from screenings containing wheat, barley, oats, corn, flax, a small amount of weed seeds, molasses and a small per cent. of salt.	5280
5.71	3.50	16.27	14.00	1 35	Cottonseed meal, malt sprouts, mixed broken grains from screenings containing wheat, barley, oats, corn, flax and molasses and small per cent. of salt.	Cottonseed meal, malt sprouts, mixed broken grains from screenings containing wheat, barley, oats, corn, flax, a considerable proportion of chaff and weed seeds, molasses and a small per cent. of salt.	5405
6.27	3-5	10.89	9.00	1 55	Cottonseed meal, flax bran, linseed meal, malt sprouts, mill feeds, molasses and salt.	Cottonseed meal, linseed meal, malt sprouts, flax plant refuse and shives, a large amount of weed seeds, molasses and salt.	5765
4.96	3.50	14.47	14.00	25 00	Cottonseed meal, malt sprouts, mixed broken grains from screenings containing wheat, barley, oats, corn, flax, molasses and small per cent. of salt.	Cottonseed meal, malt sprouts, mixed broken grains from screenings containing wheat, barley, oats, corn, flax, a small amount of weed seeds, molasses and a small per cent. of salt.	5297
5.83	3.50	15.16	14.00	25 00	Cottonseed meal, malt sprouts, mixed broken grains from screenings containing wheat, barley, oats, corn, flax, molasses and small per cent. of salt.	Cottonseed meal, malt sprouts, mixed broken grains from screenings containing wheat, barley, oats, corn, flax, a large proportion of chaff and weed seeds, molasses and a small per cent. of salt.	5237
5.38	3.50	14.97	14.00	26 00	Cottonseed meal, malt sprouts, mixed broken grains from screenings containing wheat, barley, oats, corn, flax, molasses and small per cent. of salt.	Cottonseed meal, malt sprouts, mixed broken grains from screenings containing wheat, barley, oats, corn, flax, a large proportion of weed seeds, molasses and small per cent. of salt.	5222
5.46	--------	14.16	--------	26 50			
4.78	3.50	14.30	10-15	34 00	Alfalfa, oats, corn chop, bran, linseed oil meal and ¾ of 1 per cent. salt.	As certified, ------------	5975
3.68	3.50	9.70	14.00	34 00	Alfalfa, corn chop, bran, shorts, linseed oil meal and ¾ of 1 per cent. salt.	As certified, ------------	5922
4.23	--------	12.00	--------	34 00			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5763	Yellow P. & S. Feed, Phelps & Sibley Co., Cuba, N. Y.	Carbondale, C. Ditchbrun's Sons.	26	9.09	9.13	7–8
5645	Yellow P. & S. Feed, Phelps & Sibley Co., Cuba, N. Y.	Westfield, H. Z. Pride & Son.	443	11.32	9.25	7–8
		Average,		10.20	9.19	
5888	Pioneer Stock Feed, The Pioneer Cereal Co., Akron, Ohio.	Everett, Calvin Howard,	625	7.61	9.31	10.00
5887	Pioneer Stock Feed, The Pioneer Cereal Co., Akron, Ohio.	Bedford, D. W. Prosser,	624	7.58	9.31	10.00
5683	Pioneer Stock Feed, The Pioneer Cereal Co., Akron, Ohio.	Homestead, Vallowe Bros.,	481	9.90	10.13	10.00
		Average,		8.36	9.58	
5348	Pritts' Cow Feed, J. E. Pritts, Scottdale, Pa.	Scottdale, J. E. Pritts,	146	10.14	21.00	18–22
5330	Blue Ribbon Dairy Feed, The Quaker Oats Co., Chicago, Ill.	Greensburg, W. N. Davis,	128	7.73	26.13	25.00
5373	Blue Ribbon Dairy Feed, The Quaker Oats Co., Chicago, Ill.	Brownsville, Garwood & Luce.	171	5.29	26.81	25.00
5684	Blue Ribbon Dairy Feed, The Quaker Oats Co., Chicago, Ill.	Monongahela, H. R. Hanna,	482	8.76	24.87	25.00
5274	Blue Ribbon Dairy Feed, The Quaker Oats Co., Chicago, Ill.	Butler, H. J. Klingler & Co.	72	6.36	28.06	25.00
5375	Blue Ribbon Dairy Feed, The Quaker Oats Co., Chicago, Ill.	Belle Vernon, C. N. Luce,	173	10.62	19.74	25.00
5984	Blue Ribbon Dairy Feed, The Quaker Oats Co., Chicago, Ill.	Derry, J. O. Nicely,	686	9.35	24.98	25.00
5971	Blue Ribbon Dairy Feed, The Quaker Oats Co., Chicago, Ill.	Pitcairn, D. F. Salyards,	673	8.82	23.90	25.00
		Average,		8.13	24.93	

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
5.08	3-4	6.70	9.00	$29 00	Composed of western corn and oat hulls.	As certified, ------------	5763
4.38	3-4	6.05	9.00	26 00	Composed of western corn and oat hulls.	As certified, ------------	5645
4.73	--------	6.37	--------	27 50			
3.68	3.50	8.92	9.00	1 50	Shelled corn, barley, oat shorts and oat middlings.	As certified, ------------	5888
3.50	3.50	9.99	9.00	1 50	Shelled corn, barley, oat shorts and oat middlings.	As certified, ------------	5887
4.30	3.50	7.32	3.50	1 60	Shelled corn, barley, oat shorts and oat middlings.	As certified, ------------	5683
3.83	--------	8.74	--------	30 67			
5.08	5-8	8.70	13-15	1 50	Wheat bran, wheat middlings, corn chop, alfalfa meal and cottonseed meal.	As certified, ------------	5348
5.47	4.50	9.93	9.00	30 00	Cottonseed meal, malt sprouts, bran, corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and molasses.	As certified, ------------	5330
5.15	4.50	9.95	9.00	1 50	Cottonseed meal, malt sprouts, bran, corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and molasses.	As certified, ------------	5373
5.15	4.50	11.36	9.00	1 50	Cottonseed meal, malt sprouts, bran, corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and molasses.	As certified, ------------	5684
4.43	4.50	10.60	9.00	1 60	Cottonseed meal, malt sprouts, bran, corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and molasses.	As certified, ------------	5274
4.93	4.50	9.15	9.00	28 00	Cottonseed meal, malt sprouts, bran, corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and molasses.	As certified, ------------	5375
4.16	4.00	9.44	9.00	1 60	Wheat bran, cottonseed meal, malt sprouts, corn, molasses, oat meal mill by-product (oat middlings, oat hulls, oat shorts) and ½ of 1 per cent. salt.	As certified, ------------	5984
4.92	4.00	10.14	9.00	1 75	Wheat bran, cottonseed meal, malt sprouts, corn, molasses, oat meal mill by-product (oat middlings, oat hulls, oat shorts) and ½ of 1 per cent. salt.	As certified, ------------	5971
4.89	--------	10.08	--------	31 00			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5790	Boss Feed, The Quaker Oats Co., Chicago, Ill.	Myersdale, Habel & Phillips.	560	8.85	8.94	8.00
6119	Boss Feed, The Qpaker Oats Co., Chicago, Ill.	Chester, T. Frank McCall, --	821	8.51	9.38	8.00
		Average, ----------------	--------	8.68	9.16	--------
5451	Buckeye Mixed Feed, The Quaker Oats Co., Chicago, Ill.	Monaca, Allen Davidson, --	249	9.53	16.81	13.00
5374	Buckeye Mixed Feed, The Quaker Oats Co., Chicago, Ill.	Brownsville, Garwood & Luce.	172	10.41	17.19	13.00
5944	Buckeye Mixed Feed, The Quaker Oats Co., Chicago, Ill.	Oil City, New Model Milling Co.	660	10.78	17.19	13.00
5755	Buckeye Mixed Feed, The Quaker Oats Co., Chicago, Ill.	Laceyville, Resseguie & Westcott.	18	10.48	17.06	13.00
5845	Buckeye Mixed Feed, The Quaker Oats Co., Chicago, Ill.	Washington, C. B. Ruch, --	582	10.54	17.00	13.00
		Average, ----------------	--------	10.34	17.05	--------
5784	C. O. & B. Feed, The Quaker Oats Co., Chicago, Ill.	Somerset, H. C. Beerits' Sons.	554	8.04	11.56	10.00
5470	C. O. & B. Feed, The Quaker Oats Co., Chicago, Ill.	Kittanning, William Gates' Estate.	268	9.16	11.13	10.00
5941	C. O. & B. Feed, The Quaker Oats Co., Chicago, Ill.	Oil City, Magee Feed Co., --	657	8.03	10.88	10.00
5368	C. O. & B. Feed, The Quaker Oats Co., Chicago, Ill.	Uniontown, W. S. Smith, --	166	8.65	10.31	10.00
		Average, ----------------	--------	8.47	10.97	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.50	3.50	8.90	9.00	$1 50	Corn, hominy feed, oats, oat middlings, oat hulls and oat shorts. Maximum salt ¾ of 1 per cent.	As certified, ...	5790
4.78	3.50	9.42	9.00	32 00	Corn, hominy feed, oats, oat middlings, oat hulls and oat shorts. Maximum salt ¾ of 1 per cent.	As certified, ...	6119
4.64	....	9.16	....	31 00			
4.80	4.00	7.22	8.00	1 45	Wheat bran, wheat middlings and ground wheat.	As certified, ...	5451
5.25	4.00	7.90	8.00	1 45	Wheat bran, wheat middlings and ground wheat.	As certified, ...	5374
5.00	4.00	8.15	8.00	1 50	Wheat bran, wheat middlings and ground wheat.	As certified, ...	5944
5.75	4.00	8.05	8.00	28 00	Wheat bran, wheat middlings and ground wheat.	As certified, ...	5755
5.35	4.00	7.90	8.00	30 00	Wheat bran, wheat middlings and ground wheat.	As certified, ...	5845
5.23	....	7.84	....	29 20			
4.40	3.25	9.45	9.00	1 50	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls and oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5784
4.00	3.25	9.50	9.00	1 20	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls and oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5470
4.45	3.25	10.17	9.00	30 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls and oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5941
3.93	3.25	9.67	9.00	1 50	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls and oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5368
4.20	....	9.69	....	28 50			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5904	Quaker Dairy Molasses Feed, The Quaker Oats Co., Chicago, Ill.	Berwick, T. M. Bomboy, --	66	9.52	13.31	16.00
5331	Quaker Dairy Molasses Feed, The Quaker Oats Co., Chicago, Ill.	Greensburg, W. N. Davis, --	129	10.18	15.71	16.00
5359	Quaker Dairy Molasses Feed, The Quaker Oats Co., Chicago, Ill.	Uniontown, King Bros., ---	157	8.74	14.69	16.00
6155	Quaker Dairy Molasses Feed, The Quaker Oats Co., Chicago, Ill.	Lewistown, Lewistown Ice and Storage Co.	857	7.94	13.81	16.00
6013	Quaker Dairy Molasses Feed, The Quaker Oats Co., Chicago, Ill.	Linesville, Linesville Coal, Lime and Cement Co.	715	11.47	13.52	16.00
5846	Quaker Dairy Molasses Feed, The Quaker Oats Co., Chicago, Ill.	Washington, C. B. Ruch, --	583	7.02	14.79	16.00
5477	Quaker Dairy Molasses Feed, The Quaker Oats Co., Chicago, Ill.	Tarentum, J. A. Sharp, --	275	9.81	5.99	16.00
5695	Quaker Dairy Molasses Feed, The Quaker Oats Co., Chicago, Ill.	Blairsville, Smith & McKelvey.	493	8.54	14.44	16.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.23	3.50	12.83	9.00	$26 00	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn and molasses.	As certified.	5904
5.63	3.50	11.84	9.00	25 00	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn and molasses.	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn, small amount of weed seeds and molasses.	5331
4.19	3.50	14.16	9.00	30 00	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn and molasses.	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn, small amount of weed seeds and molasses.	5359
4.33	3.50	14.86	9.00	1 25	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn and molasses.	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn, weed seeds and molasses.	6155
4.39	3.50	11.10	9.00	24 00	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn and molasses.	As certified.	6013
4.43	3.50	12.43	9.00	29 00	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn and molasses.	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn, small amount of weed seeds and molasses.	5846
5.02	3.50	13.21	9.00	1 40	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls and oat middlings), corn and molasses.	As certified.	5477
4.94	3.50	13.70	9.00	23 00	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls and oat middlings), corn and molasses.	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls, oat middlings), corn, weed seeds and molasses.	5695

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
5758	Quaker Dairy Molasses Feed, The Quaker Oats Co., Chicago, Ill.	Meshoppen, C. B. Tyler,	21	8.83	14.48	16.00
5250	Quaker Dairy Molasses Feed, The Quaker Oats Co.,, Chicago, Ill.	Johnstown, Valley Mills,	50	9.44	14.95	16.00
		Average,		9.14	14.57	
5769	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Tyrone, The Bayer Gillam Co.	539	8.88	11.88	10.00
5998	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	East Pittsburg, James Beech & Son.	700	7.54	11.00	10.00
5761	Schumacher Stock Feed. The Quaker Oats Co., Chicago, Ill.	Great Bend, Albert Bolt,	24	8.42	12.31	10.00
5903	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Berwick, T. M. Bomboy,	65	8.03	12.31	10.00
5230	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Annville, Gatz & Newgard,	30	7.72	11.00	10.00
5465	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Kittanning, J. A. Gault Co.	263	9.06	11.13	10.00
5433	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Atglen, W. S. Hastings & Son.	231	8.11	10.88	10.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.79	3.50	12.92	9.00	$28 00	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls and oat middlings), corn and molasses.	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls and oat middlings), corn, small amount of weed seeds and molasses.	5758
5.07	3.50	12.51	9.00	1 30	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls and oat middlings), corn and molasses.	Cottonseed meal, grain screenings, flax pods and stalks, oat meal mill by-product (oat shorts, oat hulls and oat middlings), corn, small amount of weed seeds and molasses.	5250
4.70	--------	12.95	--------	26 40			
3.90	3.25	9.72	9.00	28 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ------------	5769
4.38	3.25	9.77	9.00	31 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ------------	5998
4.20	3.25	8.72	9.00	28 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ------------	5761
4.33	3.25	9.32	9.00	29 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ------------	5903
5.00	3.25	10.28	9.00	26 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ------------	5230
4.23	3.25	9.82	9.00	1 25	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ------------	5465
4.85	3.25	9.92	9.00	26 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ------------	5433

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5852	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Washington, C. S. Hunter Co.	589	8.30	11.38	10.00
5966	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Spring Mount, Charles S. Kline.	95	8.15	10.50	10.00
6153	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Lewistown, Lewistown Ice and Storage Co.	855	8.89	11.63	10.00
5832	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Lykens, Lykens Mercantile Co.	61	8.57	11.13	10.00
5737	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	New Albany, F. S. Wynard.	14	8.65	11.50	10.00
5335	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Greensburg, Harry Orr & Co.	133	8.60	11.38	10.00
5307	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Lancaster, Fred Pontz, --	105	10.22	10.88	10.00
5754	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Laceyville, Resseguie & Westcott.	17	9.13	11.56	10.00
5972	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Pitcairn, D. F. Salyards,--	674	8.58	10.50	10.00
5926	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Allentown, George B. Shelly Estate.	73	8.65	11.44	10.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct. 4.28	Per ct. 3.25	Per ct. 9.32	Per ct. 9.00	$32 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5852
4.53	3.25	9.82	9.00	31 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5966
4.08	3.25	9.14	9.00	1 60	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	6153
3.93	3.25	9.87	9.00	27 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5832
3.83	3.25	9.15	9.00	28 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5737
4.78	3.25	10.75	9.00	1 30	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5335
4.23	3.25	9.30	9.00	24 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5307
4.38	3.25	8.65	10.00	27 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), cottonseed meal and ½ of 1 per cent. salt.	As certified, ...	5754
4.13	3.25	9.57	9.00	1 60	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5972
4.40	3.25	9.95	9.00	32 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified, ...	5926

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6017	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Erie, George L. Siegel,	719	7.46	11.38	10.00
5580	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Munson Station, Jacob Smitzinger.	378	8.67	11.00	10.00
5706	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Indiana, St. Clair, Rinn & Co	504	9.15	10.75	10.00
5751	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Clarion, B. W. Thompson,	533	8.86	11.56	10.00
5252	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Johnstown, Valley Mills,	52	9.30	10.81	10.00
5446	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Beaver, Adam D. Vogt,	244	9.36	10.75	10.00
5764	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Honesdale, Wayne Milling Co.	27	8.39	10.88	10.00
5881	Schumacher Stock Feed, The Quaker Oats Co., Chicago, Ill.	Hopewell, M. V. Zeth,	618	8.54	11.63	10.00
		Average,		8.60	11.25	
5874	Sterling Feed, The Quaker Oats Co., Chicago, Ill.	Mapleton, H. O. Andrews,	611	8.59	11.88	10.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.55	3.25	9.15	9.00	$30 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified,	6017
3.65	3.25	9.30	9.00	26 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified,	5580
3.90	3.25	9.15	9.00	28 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified,	5706
4.03	3.25	9.67	9.00	1 50	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified,	5751
4.20	3.25	9.60	9.00	1 40	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified,	5252
3.93	3.25	8.57	9.00	1 25	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified,	5446
3.43	3.25	9.20	9.00	28 00	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified,	5764
4.60	3.25	10.03	9.00	1 70	Corn, barley, wheat flour, oat meal mill by-product (oat shorts, oat hulls, oat middlings), 50 lbs. cottonseed meal per ton and ½ of 1 per cent. salt.	As certified,	5881
4.23	--------	9.50	--------	28 52			
4.25	4.00	9.90	9.00	1 50	Corn, oats, barley, cottonseed meal, red dog flour, oat meal mill by-products (oat middlings, oat hulls and oat shorts). Maximum salt ¾ of 1 per cent.	As certified,	5874

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
6174	Sterling Feed, The Quaker Oats Co., Chicago, Ill.	Mifflin, Manbeck, Nelson & Co.	876	8.25	10.75	10.00
		Average,		8.42	11.32	
6000	Sterling Stock Feed, The Quaker Oats Co., Chicago, Ill.	Turtle Creek, F. J. Riddle,	702	7.61	10.63	10.00
6164	Sterling Stock Feed, The Quaker Oats Co., Chicago, Ill.	McVeytown, Jno. T. Rodgers.	866	8.43	10.50	10.00
		Average,		8.02	10.57	
5429	Victor Feed, The Quaker Oats Co., Chicago, Ill.	Coatesville, P. D. Handwork Co., Ltd.	227	10.13	8.75	8.00
5685	Victor Feed, The Quaker Oats Co., Chicago, Ill.	Monongahela, H. R. Hanna.	483	10.85	8.19	8.00
6183	Victor Feed, The Quaker Oats Co., Chicago, Ill.	Jeannette, Keystone Supply Co.	885	9.29	9.63	8.00
5357	Victor Feed, The Quaker Oats Co., Chicago, Ill.	Uniontown, King Bros.,	155	8.71	8.75	8.00
5270	Victor Feed, The Quaker Oats Co., Chicago, Ill.	Butler, The Leedom & Worrall Co.	68	9.48	9.13	8.00
6154	Victor Feed, The Quaker Oats Co., Chicago, Ill.	Lewistown, Lewistown Ice and Storage Co.	856	8.97	9.31	8.00
5990	Victor Feed, The Quaker Oats Co., Chicago, Ill.	Braddock, Marriott & Son.	692	8.20	9.75	8.00
5986	Victor Feed, The Quaker Oats Co., Chicago, Ill.	Derry, J. O. Nicely,	688	9.38	9.88	8.00
5907	Victor Feed, The Quaker Oats Co., Chicago, Ill.	Millville, M. W. Shoemaker & Son.	69	8.25	9.88	8.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.05	4.00	9.30	9.00	$1 55	Corn, oats barley, cottonseed meal, red dog flour, oat meal mill by-products (oat middlings, oat hulls and oat shorts). Maximum salt ¾ of 1per cent.	As certified, ...	6174
4.15	--------	9.60	--------	30 50			
4.10	3.25	9.50	9.00	30 00	Corn, barley, wheat flour, cottonseed meal, oat meal mill by-product (oat middlings, oat hulls, oat shorts) and ½ of 1 per cent. salt.	As certified, ...	6000
4.05	3.25	10.67	9.00	1 45	Corn, barley, wheat flour, cottonseed meal, oat meal mill by-product (oat middlings, oat hulls, oat shorts) and ½ of 1 per cent. salt.	As certified, ...	6164
4.08	--------	10.08	--------	29 50			
4.48	3.50	8.85	9.00	23 00	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified, ...	5429
3.75	3.50	8.55	9.00	1 25	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified, ...	5685
5.63	3.50	9.17	9.00	32 00	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified, ...	6183
5.30	3.50	9.77	9.00	24 00	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified, ...	5357
4.25	3.50	8.50	9.00	21 00	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified, ...	5270
4.65	3.50	8.90	9.00	1 55	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified, ...	6154
5.08	3.50	8.25	9.00	1 80	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified, ...	5990
4.83	3.50	9.82	9.00	1 60	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified, ...	5986
5.80	3.50	9.27	9.00	30 00	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified, ...	5907

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5387	Victor Feed, The Quaker Oats Co., Chicago, Ill.	York, H. H. Smyser,	185	10.39	8.69	8.00
		Average,		9.66	9.20	
5686	White Diamond Feed, The Quaker Oats Co., Chicago, Ill.	Monongahela, D. E. Gamble.	484	10.34	8.50	8.00
5851	White Diamond Feed, The Quaker Oats Co., Chicago, Ill.	Washington, C. S. Hunter Co.	588	8.89	9.44	8.00
5914	White Diamond Feed, The Quaker Oats Co., Chicago, Ill.	McKeesport, Keystone Commercial Co.	642	9.85	9.31	8.00
5436	White Diamond Feed, Fine C. & O., The Quaker Oats Co., Chicago, Ill.	Beaver Falls, M. W. McCandless.	234	10.48	8.75	8.00
5458	White Diamond Feed, Fine C. & O., The Quaker Oats Co., Chicago, Ill.	Vandergrift, T. J. Rowley,	256	10.20	9.44	8.00
5453	White Diamond Feed, The Quaker Oats Co., Chicago, Ill.	Avonmore, T. P. Sturgeon.	251	11.61	8.88	8.00
		Average,		10.22	9.05	
6148	"Boveta Brand," Cottonseed Hull and Meal Mixture, Southern Cotton Oil Co., Charlotte, N. C.	Quarryville, S. Book & Bro.	850	8.71	19.25	17.00
5229	"Boveta Brand," Cottonseed Hull and Meal Mixture, Southern Cotton Oil Co., Charlotte, N. C.	Annville, Gantz & Newgard.	29	7.45	16.81	17.00
5310	"Boveta Brand," Cottonseed Hull and Meal Mixture, Southern Cotton Oil Co., Charlotte, N. C.	Manheim, F. K. Nauman,	108	7.87	16.63	17.00
		Average,		8.01	17.56	
5244	Cottonseed Feed Meal, Southern Fiber Co., Portsmouth, Va.	Lebanon, Henry Kreider,	44	7.85	20.19	22.00
6136	"Jersey Cow," Feed, Southern Fiber Co., Portsmouth, Va.	Elizabethtown, E. H. Lehman.	838	7.98	8.44	10.00
6137	"Ko-Bos," Dairy Feed, Southern Fiber Co., Portsmouth, Va.	Elizabethtown, E. H. Lehman.	839	7.81	19.00	16.00
5278	Prime Cottonseed Feed, Southern Fiber Co., Portsmouth, Va.	Lancaster, Esbenshade & Co.	76	6.82	10.13	10.00
6138	"Royal Feed," Southern Fiber Co., Portsmouth, Va.	Elizabethtown, E. H. Lehman.	840	7.85	20.94	22.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.75	3.50	8.85	9.00	$22 00	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified.	5387
4.85	--------	8.99	--------	27 60			
3.85	3.25	8.55	9.00	25 00	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified,	5686
4.13	3.25	8.20	9.00	30 00	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified,	5851
3.83	3.25	6.02	9.00	28 00	Corn, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified,	5914
4.15	3.25	6.65	9.00	21 00	------------------------------	Corn, oat middlings, oat shorts, oat hulls and salt.	5436
5.00	3.25	8.32	9.00	22 00	------------------------------	Corn, oat middlings, oat shorts, oat hulls and salt.	5458
4.78	3.25	5.57	9.00	21 00	Corn, oat meal mill by-product (oat middlings, oat hulls, oat shorts) and ½ of 1 per cent. salt.	As certified,	5453
4.29	--------	7.21	--------	24 50			
3.63	3.00	29.27	40.00	25 00	Cottonseed hulls and meal.	As certified,	6148
3.40	3.00	28.32	40.00	25 00	Cottonseed hulls and meal.	As certified,	5229
4.05	3.00	26.47	40.00	25 50	Cottonseed hulls and meal.	As certified,	5310
3.69	--------	28.02	--------	25 17			
4.35	4.00	23.10	22.00	30 00	Cottonseed meal and cottonseed hulls.	As certified,	5244
2.05	1.80	34.60	35.00	21 00	Cottonseed meal and cottonseed hulls.	As certified,	6136
3.60	3.10	26.37	32.00	23 00	Cottonseed meal and cottonseed hulls.	As certified,	6137
2.40	1.80	28.35	35.00	22 00	Cottonseed meal and cottonseed hulls.	As certified,	5278
4.25	4.00	25.17	22.00	26 00	Cottonseed meal and cottonseed hulls.	As certified,	6138

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5418	Sugarine Dairy Feed, The Sugarine Co., Chicago, Ill.	West Chester, C. C. Hipple & Son.	216	10.91	16.48	16.50
6117	Sugarine Dairy Feed, The Sugarine Co., Chicago, Ill.	Chester, T. Frank McCall,	819	11.44	17.01	16.50
5906	Sugarine Dairy Feed, The Sugarine Co., Chicago, Ill.	Millvale, M. W. Shoemaker & Son.	68	11.36	18.27	16.50
6051	Sugarine Dairy Feed, The Sugarine Co., Chicago, Ill.	Doylestown, M. E. Yost,	753	10.99	17.24	16.50
		Average,		11.17	17.25	
5239	Star Feed, The Toledo Elevator Co., Toledo, Ohio.	Palmyra, A. S. Stauffer,	39	9.23	9.31	8–10
6187	Camp's Wamba Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Wilmerding, Routh & Co.,	889	11.89	10.69	10–12
5208	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	West Chester, I. H. Bailey,	8	11.43	17.81	17.00
5256	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Johnstown, G. Bostert & Son.	56	12.33	17.21	17.00
5218	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Glen Rock, T. J. Brodbeck.	18	11.62	17.62	17.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.78	3.50	13.46	12.00	$25 00	Cottonseed meal, oats, barley, wheat, malt sprouts, molasses, mixed broken grains from wheat, oat, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified, ...	5418
5.47	3.50	11.92	12.00	27 00	Cottonseed meal, gluten feed, molasses, oat clippings, mixed broken grains from wheat, oat and barley screenings and ½ of 1 per cent. salt.	As certified, ...	6117
5.25	3.50	12.43	12.00	28 00	Cottonseed meal, gluten feed, molasses, oat clippings, mixed broken grains from wheat, oat and barley screenings and ½ of 1 per cent. salt.	As certified, ...	5906
4.45	3.50	10.87	12.00	26 00	Cottonseed meal, gluten feed, molasses, oat clippings, mixed broken grains from wheat, oat and barley screenings and ½ of 1 per cent. salt.	As certified, ...	6051
4.99	--------	12.17	--------	26 50			
6.55	6–7	8.22	9.00	26 00	Hominy feed, corn, ground corn cob and ½ of 1 per cent. salt.	As certified, ...	5239
4.05	3.5–4.5	3.87	5–8	1 75	Corn and wheat bran, ..	As certified, ...	6187
4.61	3.00	9.43	11.00	25 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5208
5.13	3.00	11.18	11.00	27 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, small amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5256
3.37	3.00	10.62	11.00	25 60	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, small amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5218

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5967	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Spring Mount, Clemmer & Son.	96	11.22	17.49	17.00
5203	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Topton, J. C. Cook, -----	3	11.05	18.26	17.00
5439	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Beaver Falls, Dodds & Garrett.	237	13.33	16.79	17.00
5615	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Williamsport, M. E. Donnel.	413	10.76	16.11	17.00
5219	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Wrightsville, C. C. Dosch,	19	13.12	17.10	17.00
5212	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Ephrata, Frank Fahnestock.	12	11.89	16.08	17.00
5215	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Penbrook, S. A. Fishburn,	15	11.69	18.23	17.00
6057	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Chalfont, F. D. Hartzel's Sons.	759	12.43	16.96	17.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
5.45	3.00	11.81	9.00	$25 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, small amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5967
4.32	3.00	10.45	9.00	30 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley. small amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5203
4.00	3.00	9.92	11.00	24 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley. small amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5439
3.78	3.00	10.44	11.00	1 35	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat. oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, large amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5615
3.85	3.00	9.16	9.00	1 40	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat. oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains. corn, wheat, oats, barley, large amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5219
3.38	3.00	10.65	11.00	27 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, small amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5212
4.47	3.00	10.36	11.00	26 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats. barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5215
4.46	3.00	10.11	11.00	24 50	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	As certified, ------------	6057

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5205	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Conshohocken, Henderson, Supplee & Son.	5	11.50	16.91	17.00
5214	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Harrisburg, Hoffer & Garman.	14	11.22	16.08	17.00
5217	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Carlisle, S. B. Jackson, --	17	11.38	16.40	17.00
5204	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Barto, S. B. Latshaw, --	4	11.77	17.11	17.00
5213	Hammond Dairy Feed, The, Western Grain Products Co., Hammond, Ind.	Elizabethtown, E. H. Lehman.	13	11.85	16.19	17.00
6014	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Linesville, Linesville Coal, Lime and Cement Co.	716	13.14	18.11	17.00
5248	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Palmyra, The Londonderry Mills.	48	11.65	16.63	17.00
5739	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Monroeton, C. P. Matthews.	16	12.00	18.60	17.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
5.09	3.00	11.57	11.00	$27 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5205
4.67	3.00	11.23	11.00	27 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5214
4.03	3.00	11.71	11.00	26 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5217
7.08	3.00	9.04	9.00	25 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, flax seed, considerable proportion of weed seeds, pure cane molasses and 3/10 of per cent. salt.	5204
4.14	3.00	10.77	11.00	25 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5213
6.16	3.00	11.28	11.00	24 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, separated from wheat, rye, oats and barley, wheat screenings, molasses and 3/10 of 1 per cent. salt.	As certified, ------------	60[illegible]4
4.72	3.00	9.39	9.00	24 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, small amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5248
7.17	3.00	10.24	9.00	26 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, considerable proportion of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5739

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein, Found.	Crude Protein, Guaranteed.
				Per ct.	Per ct.	Per ct.
5207	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Souderton, Moyer & Son,	7	10.77	16.28	17.00
5221	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Idaville, D. B. Myers,	21	12.87	16.49	17.00
5211	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Downingtown, E. Vinton Philips.	11	11.81	17.88	17.00
5210	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Pocopson, W. J. Pratt,	10	12.76	16.77	17.00
5961	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Red Hill, O. D. Reiter,	90	13.44	16.00	17.00
5756	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Laceyville, Resseguie & Westcott.	19	12.61	15.65	17.00
5209	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Embreeville, Robert G. Smith & Son.	9	12.22	17.61	17.00
5206	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Hatfield, George S. Snyder,	6	11.56	17.07	17.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.45	3.00	11.38	9.60	$25 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5207
4.49	3.00	10.98	11.00	25 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5221
5.50	3.00	11.10	11.00	26 50	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5211
5.20	3.00	10.44	11.00	26 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5210
6.90	3.00	10.78	11.00	24 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, separated from wheat, rye, oats and barley, wheat screenings, molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, separated from wheat, rye, oats, barley screenings, small amount of weed seeds, molasses and 3/10 of 1 per cent. salt.	5961
4.25	3.00	10.89	11.00	26 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, small amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5756
4.09	3.00	10.48	11.00	26 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5209
4.94	3.00	11.01	11.00	26 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, small amount of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5206

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
5216	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Dillsburg, J. B. Spera, --	16	11.13	17.68	17.00
5202	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Lebanon, E. Strickler's Sons.	2	11.93	17.84	17.00
5220	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Hanover, Wm. J. Young & Co.	20	12.44	18.23	17.00
5201	Hammond Dairy Feed, The Western Grain Products Co., Hammond, Ind.	Hummelstown, Daniel Yingst.	1	12.99	15.45	17.00
		Average, -------------	--------	11.99	17.05	--------
5626	Molasses Corn Flakes, The Western Grain Products Co., Hammond, Ind.	Muncy, Eaker & Vermilya,	424	9.35	23.43	24–26
5390	Molasses Flakes, The Western Grain Products Co., Hammond, Ind.	York, Strayer Bros. Co.,--	188	9.88	23.01	24–26
		Average, -------------	--------	9.61	23.22	--------
	PROPRIETARY HORSE AND MULE FEEDS.					
5600	Horse Chop, Altoona Feed Mills, Altoona, Pa.	Altoona, Altoona Feed Mills.	398	10.51	12.50	9.00
5909	Sucrene Alfalfa Horse and Mule Feed, American Milling Co., Chicago, Ill.	Irwin, T. F. Wilson Co.,	637	13.07	12.34	10.00
5422	Sucrene Horse and Mule Feed, American Milling Co., Chicago, Ill.	West Chester, E. D. Hemphill.	220	11.33	12.20	10.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.85	3.00	11.35	11.00	$26 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of per cent. salt.	5216
4.71	3.00	10.39	11.00	26 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of per cent. salt.	5202
4.34	3.00	10.46	11.00	25 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, weed seeds, pure cane molasses and 3/10 of per cent. salt.	5220
4.82	3.00	10.98	11.00	27 00	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, pure cane molasses and 3/10 of 1 per cent. salt.	Cottonseed meal, distillers' grains, malt sprouts, mixed broken grains, corn, wheat, oats, barley, large proportion of weed seeds, pure cane molasses and 3/10 of 1 per cent. salt.	5201
4.79	--------	10.63	--------	25 86			
10.02	7-9	10.95	10.00	1 50	Broken grains of corn, oats, wheat, barley, cottonseed meal, corn grains and cane molasses.	Corn, oats, wheat, barley, cottonseed meal. malt sprouts, distillers' grains, small amount of weed seeds and molasses.	5626
8.45	7-9	10.73	10.00	32 50	Broken grains of corn, oats, wheat, barley, cottonseed meal, corn grains and cane molasses.	As certified, -----------	5390
9.24	--------	10.84	--------	31 25			
6.38	3.00	5.65	9.00	30 00	Oat middlings, oat hulls, hominy. rye middlings, corn and barley.	As certified, -----------	5600
4.02	3.50	15.04	15.00	32 00	Corn, oats, barley, wheat, buckwheat, alfalfa, linseed meal, molasses and ½ of 1 per cent. salt.	As certified, -----------	5909
3.67	3.50	9.82	12.00	27 00	Corn, oats, barley, wheat, molasses and mixed broken grains from wheat, oats, buckwheat and barley screenings and ½ of 1 per cent. salt.	As certified, -----------	5422

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5665	Sucrene Horse and Mule Feed, American Milling Co., Chicago, Ill.	Sunbury, Kift Milling Co.,	463	12.35	11.32	10.00
		Average,	--------	11.84	11.76	--------
5438	Ubiko Horse and Stock Feed, The J. W. Biles Co., Cincinnati, Ohio.	Beaver Falls, M. W. Candless.	236	8.04	18.19	16.00
5705	Ubiko Horse and Stock Feed, The J. W. Biles Co., Cincinnati, Ohio.	Indiana, St. Clair, Rinn Co.	503	7.91	17.94	16.00
		Average,	--------	7.97	18.07	--------
5597	Horse Chop, E. D. Clark, Altoona, Pa.	Altoona, E. D. Clark,	395	10.23	10.88	8–10
5919	Pioneer Horse and Cattle Feed, Edwards & Loomis, Co., Chicago, Ill.	Carnegie, J. H. Burgan & Son.	647	10.09	8.13	7.50
5963	Pioneer Horse and Cattle Feed, Edwards & Loomis, Co., Chicago, Ill.	East Mauch Chunk, Quinton Stemler.	92	9.24	9.44	7.50
		Average,	--------	9.66	8.79	--------
5447	Faramel Horse and Cattle Feed, The Lake Shore Elevator Co., Cleveland, Ohio.	West Bridgewater, W. W. McCullough.	245	16.24	10.01	10.24
5514	Faramel Horse Feed, Faramel Manufacturing Co., Buffalo, N. Y.	Bradford, Smith Bros.,	312	16.64	9.42	9.93
5393	Columbia Alfalfa Horse Feed, The Hoge & McDowell Co., Washington, D. C.	York, Anderson Bros. Co.,	191	9.57	14.00	12.00
6067	Husted Horse Feed, Husted Milling Co., Buffalo, N. Y.	Colmar, C. R. Rosenberger,	769	8.81	13.94	12–14
5604	Horse Chop, Klepser Bros., Martinsburg, Pa.	Altoona, Klepser Bros.,	402	10.12	13.75	7.00
5965	Badger Alfalfa Horse and Mule Feed, Charles A. Krause Milling Co., Milwaukee, Wis.	Green Lane, Frank Barndt,	94	14.45	11.85	10.00
5873	Badger Alfalfa Horse and Mule Feed, Charles A. Krause Milling Co., Milwaukee, Wis.	Huntingdon, J. Stouffer,	610	13.60	11.37	10.00
6125	Badger Alfalfa Horse and Mule Feed, Charles A. Krause Milling Co., Milwaukee, Wis.	Ambler, J. Watson Craft,	827	15.98	12.48	10.00
		Average,	--------	14.67	11.90	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		**Crude Fiber.**		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.59	3.50	10.47	12.00	$1 40	Corn, oats, barley, wheat, molasses and mixed broken grains from wheat, oat, buckwheat and barley screenings, linseed meal and ½ of 1 per cent. salt.	As certified, ------------	5665
3.63	--------	10.14	--------	27 50			
7.05	6.00	8.47	9.00	30 50	Wheat middlings, hominy meal, wheat bran, brewers' dried grains and old process linseed meal.	As certified, ------------	5438
7.08	6.00	7.75	9.00	30 00	Wheat middlings, hominy meal, wheat bran, brewers' dried grains and old process linseed meal.	As certified, ------------	5705
7.07	--------	8.11	--------	30 25			
3.80	3.5–4.5	7.80	7–9	27 00	Shelled corn, ear corn, oats, oat middlings, oat shorts, oat hulls, flour middlings and rye middlings.	As certified, ------------	5597
3.25	2.50	8.57	8.00	1 75	Corn grits, cracked corn siftings, light oats and oat hulls.	As certified, ------------	5919
3.70	2.50	8.72	8.00	1 60	Corn grits, cracked corn siftings, light oats and oat hulls.	As certified, ------------	5963
3.48	--------	8.64	--------	33 50			
4.03	4.50	5.41	6.85	1 50	Corn, bran, oats and molasses.	As certified, ------------	5447
3.95	3.53	4.68	4.81	1 60	Oats, corn, wheat bran and molasses.	As certified, ------------	5514
4.40	3.12	12.80	13.00	33 00	Alfalfa meal, linseed meal, corn, oats, bran and salt.	As certified, ------------	5393
5.60	4–5	6.12	7–9	1 60	Corn, oats, middlings, gluten, oat hulls, oil meal and ¾ of 1 per cent. salt.	As certified, ------------	6067
4.00	3.00	3.40	7–9	1 50	Rye middlings, corn and oats.	As certified, ------------	5604
3.68	2.00	8.14	12.00	1 60	Corn, oats, alfalfa and syrup.	As certified, ------------	5965
4.00	2.00	9.56	12.00	1 60	Corn, oats, alfalfa and syrup.	As certified, ------------	5873
3.20	2.00	9.54	12.00	1 65	Corn, oats, alfalfa and syrup.	As certified, ------------	6125
3.63	--------	9.08	--------	32 34			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5672	McMahan's Prepared Horse Feed, C. H. McMahan, Milton, Pa.	Milton, C. H. McMahan,	470	8.27	21.31	18-20
5302	Sugarota Horse Feed, North-West Mills Co., Winona, Minn.	Lancaster, Sprecher & Ganss.	100	11.84	10.94	10.00
5223	Sugarota Horse Feed, North-West Mills Co., Winona, Minn.	Lebanon, A. M. Weltmer's Sons.	23	11.31	11.21	10.00
		Average,	--------	11.57	11.08	--------
5942	Perfection Horse Feed, Omaha Alfalfa Milling Co., Omaha, Neb.	Oil City, New Model Milling Co.	658	14.24	10.79	10.50
5337	Perfection Horse Feed, Omaha Alfalfa Milling Co., Omaha, Neb.	Greensburg, Harry Orr & Co.	135	17.35	10.69	10.50
		Average,	--------	15.79	10.74	--------
5857	Peters' Arab Horse Feed, M. C. Peters Mill Co., Omaha. Neb.	Canonsburg, Dunlap Bros.,	594	9.46	10.81	9.00
5899	Peters' Arab Horse Feed, M. C. Peters Mill Co., Omaha, Neb.	Oil City, Enterprise Milling Co.	636	13.83	11.09	9.00
5688	Peters' Arab Horse Feed, M. C. Peters Mill Co., Omaha, Neb.	Monongahela, D. E. Gamble.	486	14.66	10.78	9.00
5469	Peters' Arab Horse Feed, M. C. Peters Mill Co., Omaha, Neb.	Kittanning, William Gates' Estate.	267	14.98	10.07	9.00
5679	Peters' Arab Horse Feed, M. C. Peters Mill Co., Omaha, Neb.	Wilkinsburg, Johnston & Smith.	477	15.16	10.45	9.00
5381	Peters' Arab Horse Feed, M. C. Peters Mill Co., Omaha, Neb.	Charleroi, R. C. Mountser,	179	16.75	10.88	9.00
5999	Peters' Arab Horse Feed, M. C. Peters Mill Co., Omaha, Neb.	Turtle Creek, F. J. Riddle,	701	15.15	11.28	9.00
5979	Peters' Arab Horse Feed, M. C. Peters Mill Co., Omaha, Neb.	Pittsburg, Scobie & Parker Co.	681	13.27	10.89	9.00
		Average,	--------	14.15	10.78	--------
5349	Pritts' Horse Feed, J. E. Pritts, Scottdale, Pa.	Scottdale, J. E. Pritts, ---	147	9.15	14.69	12-16
5376	Molac Horse Feed, The Quaker City Oats Co., Chicago, Ill.	Belle Vernon, C. N. Luce,--	174	12.27	10.71	10.00
5367	Molac Horse Feed, The Quaker City Oats Co., Chicago, Ill.	Uniontown, W. S. Smith,--	165	12.39	10.41	10.00
		Average,	--------	12.33	15.56	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.					
Found.	Guaranteed.	Found.	Guaranteed.	Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Per ct.	Per ct.	Per ct.	Per ct.				
7.53	7-8	9.45	9-10	$28 00	Brewers' dried grains, hominy meal, cottonseed meal and middlings.	As certified. ------------	5672
3.60	3.00	16.11	14.00	1 40	Malt sprouts, corn, oats, flax bran, barley, oat clips, molasses and small per cent. of salt.	Malt sprouts, corn, oats, flax plant refuse and shives, barley, oat clips, molasses and salt.	5302
4.25	3.00	14.99	14.00	1 50	Malt sprouts, corn, oats, barley, oat clips, molasses and small per cent. of salt.	Malt sprouts, corn, oats, barley, oat clips, molasses, a large proportion of chaff and weed seeds and salt.	5223
3.93	--------	15.55	--------	29 00			
3.23	3.00	7.95	12.00	1 65	Corn, oats, alfalfa meal and molasses.	As certified, ------------	5942
2.69	3.00	8.98	12.00	1 60	Corn, oats, alfalfa meal and molasses.	As certified, ------------	5337
2.96	--------	8.46	--------	1 63			
2.99	2.00	8.98	15.00	34 00	Corn, oats, alfalfa and molasses.	As certified, ------------	5857
3.27	2.00	9.82	15.00	1 50	Corn, oats, alfalfa and molasses.	As certified, ------------	5899
4.13	2.00	8.57	15.00	28 00	Corn, oats and alfalfa flavored with molasses.	As certified, ------------	5688
3.00	2.00	8.90	15.00	1 50	Corn, oats and alfalfa flavored with molasses.	As certified, ------------	5469
3.03	2.00	8.10	15.00	1 60	Corn, oats, alfalfa and molasses.	As certified, ------------	5679
3.63	2.00	8.36	15.00	28 00	Corn, oats and alfalfa flavored with molasses.	As certified, ------------	5381
3.63	2.00	7.85	15.00	33 00	Corn, oats, alfalfa and molasses.	As certified, ------------	5999
3.10	2.00	8.77	15.00	34 00	Corn, oats, alfalfa and molasses.	As certified, ------------	5979
3.22	--------	8.66	--------	31 13			
5.00	4-5	11.02	14-17	1 40	Alfalfa meal, wheat bran, wheat middlings, corn and oats.	As certified, ------------	5349
3.50	3.25	10.30	9.00	1 60	Alfalfa, corn, oats, oat meal mill by-product (oat shorts, oat hulls and oat middlings), barley, molasses and ½ of 1 per cent. salt.	As certified, ------------	5376
3.89	3.25	9.94	9.00	1 65	Alfalfa, corn, oats, oat meal mill by-product (oat shorts, oat hulls and oat middlings), barley, molasses and ½ of 1 per cent. salt.	As certified, ------------	5367
3.70	--------	10.12	--------	32 50			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
6110	Schumacher Special Horse Feed. The Quaker Oats Co.. Chicago, Ill.	Chester, John Thompson,--	812	8.68	10.38	9.25
6006	Sherman's Excello Horse Feed, Sherman Milling Co., Meadville, Pa.	Meadville, Sherman Milling Co.	708	10.12	12.63	12–13
5257	Chicago Alfalfa Horse and Mule Feed, The Western Grain Products Co., Hammond, Ind.	Johnstown, G. Bostert & Son.	57	14.06	11.67	10.00
5389	Chicago Alfalfa Horse and Mule Feed, The Western Grain Products Co., Hammond, Ind.	York, Strayer Bros., -----	187	16.04	10.75	10.00
		Average, -------------	--------	15.05	11.21	--------
5760	Hammond Horse Feed, The Western Grain Products Co., Hammond, Ind.	Great Bend, Albert Bolt,--	23	14.40	12.85	12.00
	CALF MEALS.					
5727	Blatchford's Calf Meal, J. W. Barwell, Waukegan, Ill.	Towanda, Dayton Milling Co.	4	10.63	24.38	25.00
6185	Blatchford's Calf Meal, J. W. Barwell, Waukegan, Ill.	Jeannette, Keystone Supply Co.	887	10.17	23.06	25.00
5272	Blatchford's Calf Meal, J. W. Barwell, Waukegan, Ill.	Butler, H. J. Klingler Co.,	70	8.40	25.44	25.00
		Average, -------------	--------	9.73	24.29	--------
5773	Gregson's Calf Meal, The Great Western Cereal Co., Chicago, Ill.	Tyrone, Albright Bros. Co.,	543	8.18	27.06	25.00
5831	Gregson's Calf Meal, The Great Western Cereal Co., Chicago, Ill.	Elizabethville, J. A. Romberger.	60	8.58	26.44	25.00
		Average, -------------	--------	8.38	26.75	--------
5301	Sugarota Calf Meal, North-West Mills Co., Winona, Minn.	Lancaster, Sprecher & Ganss.	99	10.23	26.56	25.00
5771	Schumacher Calf Meal, The Quaker Oats Co., Chicago, Ill.	Tyrone, The Bayer-Gillam Co.	541	7.84	21,38	19.00
5952	Schumacher Calf Meal, The Quaker Oats Co., Chicago, Ill.	Oil City, Oil City Milling Co.	668	8.10	18.69	19.00
5460	Shumacher Calf Meal, The Quaker Oats Co., Chicago, Ill.	Vandergrift, T. J. Rowley,	258	7.74	19.44	19.00
5735	Schumacher Calf Meal, The Quaker Oats Co., Chicago, Ill.	Wysox, Smith & Waldo,--	12	13.06	18.81	19.00
		Average, -------------	--------	9.18	19.58	--------

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.00	3.25	6.90	8.00	$1 75	Corn, oats, oat meal mill by-product (oat shorts, oat hulls, oat middlings) and ½ of 1 per cent. salt.	As certified, ------------	6110
4.33	4-5	4.35	--------	33 00	Oats, corn, barley, wheat bran, wheat middlings, oil meal and salt.	As certified, ------------	6006
2.85	3.00	9.64	15.00	1 60	Corn, oats, alfalfa, linseed meal and cane molasses.	As certified, ------------	5257
3.28	3.00	8.18	15.00	27 00	Corn, oats, alfalfa, linseed meal and cane molasses.	As certified, ------------	5389
3.07	--------	8.91	--------	29 50			
2.92	2.80	9.86	11.00	28 00	Corn, oats, barley, screenings of (corn, oats, barley and wheat), linseed meal and cane molasses.	Corn, oats, barley, screenings (corn, oats, barley and wheat), linseed meal, malt sprouts, small amount of weed seeds and molasses.	5760
5.48	5.00	5.98	5.00	3 50	Locust bean meal, wheat flour, flaxseed, cottonseed meal, beans and lentils.	As certified, ------------	5727
4.48	5.00	5.97	5.00	4 40	Locust bean meal, wheat flour, flaxseed, cottonseed meal, beans and lentils.	As certified, ------------	6185
5.35	5.00	6.62	5.00	3 50	Locust bean meal, wheat flour, cottonseed meal, beans, lentils and salt.	As certified, ------------	5272
5.10	--------	6.19	--------	76 00			
6.33	5.00	5.20	5.00	3 00	Oat meal, barley, linseed and cottonseed. Maximum salt ¾ of 1 per cent.	As certified, ------------	5773
6.50	5.00	5.50	5.00	3 00	Oat meal, barley, linseed and cottonseed. Maximum salt ¾ of 1 per cent.	As certified, ------------	5831
6.42	--------	5.35	--------	3 00			
6.03	6.00	3.50	6.00	3 50	Pulverized wheat, pulverized malt, linseed meal and cottonseed meal.	As certified, ------------	5301
9.20	8.00	2.62	3.00	60 00	Oat meal, wheat meal, ground flaxseed and casein.	As certified, ------------	5771
8.25	8.00	2.70	3.00	4 00	Oat meal, wheat meal, ground flaxseed and dried milk.	As certified, ------------	5952
8.75	8.00	3.00	3.00	3 50	Oat meal, wheat meal, ground flaxseed and dried milk.	As certified, ------------	5460
8.17	8.00	2.75	3.00	3 50	Oat meal, wheat meal, ground flaxseed and dried milk.	As certified, ------------	5735
8.59	--------	2.76	--------	70 00			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
	MISCELLANEOUS FEEDS.			Per ct.	Per ct.	Per ct.
5590	Mixed Red Dog, Altoona Grain and Feed Co., Altoona, Pa.	Altoona, Altoona Grain and Feed Co.	388	10.86	11.13	--------
5557	Mixed Feed, Barnesboro Milling Co., Barnesboro, Pa.	Barnesboro, Barnesboro Milling Co.	355	12.23	9.63	4-8.5
5476	Flax Flakes, Excelsior Milling Co., Minneapolis, Minn.	Tarentum, J. A. Sharp, --	274	11.10	13.03	--------
5628	Corn, Oats and Rye Middlings, The Ring Milling Co., Muncy, Pa.	Muncy, The Ring Milling Co.	426	10.72	10.69	8-9
5585	Yellow Feed Meal, Unknown,	Osceola Mills, F. Hirsh, --	383	12.69	9.19	--------
	MISCELLANEOUS CHOP FEEDS.					
	Corn Chops.					
5567	Corn Chop, G. D. Benn, Coalport, Pa.	Coalport, G. D. Benn, ---	365	12.59	9.00	--------
5658	Corn Chop, Blank & Gottshall, Sunbury, Pa.	Sunbury, Blank & Gottshall.	456	*3.80	10.06	--------
5490	Corn Chop, Cash Wholesale Co., Johnsonburg, Pa.	Johnsonburg, Cash Wholesale Co.	288	15.21	8.31	--------
5589	Pure Corn Feed, F. E. Farabaugh, Patton, Pa.	Patton, F. E. Farabaugh,	387	13.12	8.69	--------
5563	Corn Chop, E. D. Fry, Cresson, Pa.	Cresson, E. D. Fry, ----	361	12.84	8.75	--------
5475	Corn Chop, Johnston & Hamilton, Parnassus, Pa.	Parnassus, Johnston & Hamilton.	273	13.71	9.13	--------
5989	Corn Chop, J. O. Nicely, Derry, Pa.	Derry, J. O. Nicely, -----	691	11.78	9.81	--------
5569	Corn Chop, H. M. Pentz, Glen Hope, Pa.	Glen Hope, H. M. Pentz,	367	8.77	8.56	--------
		Average, -------------	--------	12.57	9.04	--------
	Rye Chops.					
5657	Rye Chop, Blank & Gottshall, Sunbury, Pa.	Sunbury, Blank & Gottshall.	455	11.23	11.50	--------
5565	Rye Chop, E. D. Fry, Cresson, Pa.	Cresson, E. D. Fry, -----	363	12.20	11.19	--------
5570	Rye Chop, H. M. Pentz, Glen Hope, Pa.	Glen Hope, H. M. Pentz,	368	10.47	11.19	--------
		Average, -------------	--------	11.30	11.29	--------
	Corn and Oat Chops.					
6038	Corn and Oats Chop, Acme Milling Co., Corry, Pa.	Corry, Acme Milling Co., --	740	8.90	11.13	--------
5648	Corn and Oats Chop, J. H. Burch, Knoxville, Pa.	Knoxville, J. H. Burch, --	446	12.37	9.88	--------
5566	Corn and Oats Chop, G. D. Benn, Coalport, Pa.	Coalport, G. D. Benn, ---	364	11.03	9.88	--------
5937	Chop, Blaine, Mackay, Lee Co., North East, Pa.	Tionesta, L. J. Hopkins,	653	10.35	11.25	--------
5656	Corn and Oats Chop, Blank and Gottshall, Sunbury, Pa.	Sunbury, Blank & Gottshall.	454	7.81	10.13	--------
5596	Corn and Oats Chop, E. D. Clark, Altoona, Pa.	Altoona, E. D. Clark, ---	394	12.34	9.69	8-10

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*Excluded from average.

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
6.45	--------	1.77	--------	--------	--------	Hominy feed and wheat flour middlings.	5590
4.08	2–2.5	2.50	2–5	$26 00	Corn and oats screenings.	As certified,	5557
5.13	--------	12.14	--------	1 50	--------	Flax screenings consisting largely of weed seeds.	5476
4.33	2–3	3.92	3–6	1 50	Corn, oats and rye middlings.	As certified,	5628
4.23	--------	2.20	--------	1 35	--------	Corn product,	5585
4.10	--------	1.82	--------	1 25	Corn,	As certified,	5567
6.75	--------	2.25	--------	1 35	Corn,	As certified,	5659
3.38	--------	1.62	--------	1 40	Pure corn,	As certified,	5490
4.05	--------	2.10	--------	1 25	Corn,	As certified,	5589
3.75	--------	1.60	--------	1 35	Corn,	As certified,	5563
4.15	--------	1.95	--------	25 00	Pure corn,	As certified,	5475
4.33	--------	1.85	--------	1 75	Pure corn,	As certified,	5989
3.30	--------	1.85	--------	1 40	Corn,	As certified,	5569
4.23	--------	1.88	--------	1 53			
2.10	--------	2.02	--------	1 80	Rye,	As certified,	5657
2.00	--------	1.90	--------	1 55	Rye,	As certified,	5565
2.00	--------	1.80	--------	1 70	Rye,	As certified,	5570
2.03	--------	1.90	--------	1 68			
4.68	--------	7.00	--------	33 00	Corn and oats,	As certified,	6038
3.85	--------	3.72	--------	1 40	Corn and oats,	As certified,	5648
4.03	--------	3.30	--------	1 25	Corn and oats,	As certified,	5566
4.33	--------	3.10	--------	1 65	--------	Corn and oats,	5937
4.78	--------	5.55	--------	1 35	Corn and oats,	As certified,	5656
5.00	3.5–4.5	4.47	7–9	27 00	Corn and oats,	As certified,	5596

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5806	Superior Corn and Oats Chop, E. D. Clark, Altoona, Pa.	Altoona, E. D. Clark,	564	9.73	9.63	10.00
6019	Corn and Oats Chop, Wm. A. Coombs, Cold Water, Mich.	Erie, D. J. Carroll,	721	8.87	11.06	--------
5501	Corn and Oats Feed, Crouch Bros. Co., Erie, Pa.	Kane, Swanson Grocery Co.	299	12.72	9.44	8.75
5552	Corn and Oats Chop, J. W. Eberts, Clearfield, Pa.	Clearfield, J. W. Eberts,	350	11.61	9.75	--------
5560	Corn and Oats Chop, W. A. Eckenrode, Carrolltown, Pa.	Carrolltown, W. A. Eckenrode.	358	12.50	9.13	--------
5293	Pure Ground Corn and Oats, John W. Eshelman, Lancaster, Pa.	Lancaster, John W. Eshelman.	91	12.36	10.25	--------
5522	Corn and Oats Chop, Eulalia Mills, Coudersport, Pa.	Coudersport, Eulalia Mills,	320	10.83	10.38	--------
5876	Corn and Oats Chop, J. B. Ewing, Orbisonia, Pa.	Orbisonia, J. B. Ewing,	613	9.86	10.38	--------
5588	Pure Corn and Oats Feed, F. E. Farabaugh, Patton, Pa.	Patton, F. E. Farabaugh,	386	12.28	10.50	--------
5509	Corn and Oats Chop, L. A. Fischer & Co., Bradford, Pa.	Bradford, L. A. Fischer & Co.	307	10.82	10.44	--------
5562	Corn and Oats Chop, E. D. Fry, Cresson, Pa.	Cresson, E. D. Fry,	360	12.22	9.06	--------
5506	Corn and Oats Chop, C. Herzog, Smethport, Pa.	Smethport, C. Herzog,	304	12.13	10.06	--------
5890	Corn and Oats Chop, John Howard, Everett, Pa.	Everett, John Howard,	627	8.90	8.44	6.66
5945	Pure Corn and Oats Chop, Johnson & Co., Franklin, Pa.	Franklin, Johnson & Co.,	661	9.88	11.44	--------
5474	Corn and Oats Chop, Johnston & Hamilton, Parnassus, Pa.	Parnassus, Johnston & Hamilton.	272	11.66	10.88	--------
5795	Mixed Chop, Kaufman, Schaeffer & Co., Fleetwood, Pa.	Fleetwood, Kaufman Schaeffer & Co.	31	9.61	10.94	--------
5918	Corn and Oats Chop, Keystone Commercial Co., Pittsburg, Pa.	Carnegie, J. H. Burgen & Son.	646	10.40	11.00	--------
5603	Cow Chop, Klepser Bros., Martinsburg, Pa.	Altoona, Klepser Bros.,	401	11.28	9.88	7.00
5949	Corn and Oats Chop, J. H. Lavery, Franklin, Pa.	Franklin, J. H. Lavery,	665	10.06	10.69	--------
5284	Corn and Oats Chop, Levan & Sons, Lancaster, Pa.	Lancaster, Levan & Sons,	82	8.77	9.94	--------
6177	Corn and Oats Chop, Manbeck, Nelson Co., Mifflin, Pa.	Mifflin, Manbeck, Nelson & Co.	879	9.63	10.75	--------
5812	Corn and Oats Chop, E. C. Masemer, Carlisle, Pa.	Mt. Holly, J. N. Weigel,	41	10.02	10.31	--------
5837	Corn and Oats Chop, Mathers Bros., Greenville, Pa.	Greenville, Mathers Bros..	574	9.95	10.63	--------
5902	Mixed Chop, Millard & Scureman, Kingston, Pa.	Berwick, Berwick Store Co.	64	7.90	8.63	8-11
5988	Corn and Oats Chop, J. O. Nicely, Derry, Pa.	Derry, J. O. Nicely,	690	10.49	10.44	--------
5269	Esmeralda Corn and Oats Chop, The Ohio Cereal Co., Circlesville, Ohio.	Butler, The Leedom & Worrall Co.	67	11.92	9.56	10.00
5953	Corn and Oats Chop, Oil City Milling Co., Oil City, Pa.	Oil City, Oil City Milling Co.	669	9.42	11.56	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct. 4.73	Per ct. 3.00	Per ct. 3.80	Per ct. 9.00	$1 50	Oats and corn tailings from cracked corn.	As certified, ------------	5806
5.88	--------	4.25	--------	32 00	Corn and oats, ----------	As certified, ------------	6019
4.30	4.05	3.77	3.42	1 15	Corn and oats feed, -----	As certified, ------------	5501
4.35	--------	2.77	--------	1 25	Corn and oats, ----------	As certified, ------------	5552
4.08	--------	2.55	--------	1 50	Corn and oats, ----------	As certified, ------------	5560
3.78	--------	4.17	--------	1 30	Corn and oats, ----------	As certified, ------------	5293
4.25	--------	4.52	--------	1 35	Corn and oats, ----------	As certified, ------------	5522
4.18	--------	3.32	--------	1 60	Corn and oats, possibly a trace of rye.	Corn and oats, --------	5876
4.40	--------	3.75	--------	27 00	Corn and oats, ----------	As certified, ------------	5588
4.60	--------	6.27	--------	1 30	Corn and oats, ----------	As certified, ------------	5509
4.10	--------	2.95	--------	1 40	Corn and oats, possibly a trace of rye.	As certified, ------------	5562
4.45	--------	3.70	--------	1 25	Corn and oats, ----------	As certified, ------------	5506
3.75	2.50	6.45	11.00	28 00	Corn and oat feed, ------	As certified, ------------	5890
4.93	--------	3.95	--------	1 70	Corn and oats, ----------	As certified, ------------	5945
4.80	--------	4.97	--------	27 00	Pure corn and oats, ----	As certified, ------------	5474
4.73	--------	3.32	--------	1 65	Corn and oats, ----------	Corn, oats and small amount of rye.	5795
4.45	--------	3.90	--------	1 85	Corn and oats, ----------	As certified, ------------	5918
4.33	3.00	3.45	7–9	1 45	Corn and oats, ----------	As certified, ------------	5603
4.55	--------	3.95	--------	1 65	Corn and oats, ----------	As certified, ------------	5949
4.60	--------	4.15	--------	30 00	Corn and oats, ----------	As certified, ------------	5284
4.10	--------	4.00	--------	1 60	Corn and oats, ----------	As certified, ------------	6177
4.55	--------	3.25	--------	1 60	Corn and oats chop, ----	As certified, ------------	5812
4.20	--------	3.47	--------	1 45	Corn and oats, ----------	As certified, ------------	5837
3.35	4–6	9.52	4–6	1 70	----------------------------	Corn and oats, --------	5902
4.28	--------	3.95	--------	1 75	Pure corn and oats, -----	As certified, ------------	5988
5.23	4.00	2.92	6.00	23 50	Corn and oats, ----------	As certified, ------------	5269
4.53	--------	4.32	--------	1 70	Corn and oats, ----------	As certified, ------------	5953

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
5568	Corn and Oats Chop, H. M. Pentz, Glen Hope, Pa.	Glen Hope, H. M. Pentz, --	366	11.63	9.19	--------
5527	Corn and Oats Chop, E. J. Rogers, Emporium, Pa.	Emporium, E. J. Rogers,	325	10.70	10.00	--------
5713	Pure Corn and Oats Chop, The Richards & Evans Co., Cortland, Ohio.	New Castle, New Castle Feed Co.	511	10.55	10.63	--------
5638	Corn and Oats Chop, B. Schrader & Son, Wellsboro, Pa.	Wellsboro, B. Schrader & Son.	436	11.62	10.19	--------
5556	Corn and Oats Chop, John W. Smith & Bro., Clearfield, Pa.	Clearfield, John W. Smith & Bro.	354	10.91	9.56	--------
5804	Corn and Oats Chop, Wertz Milling Co., Reading, Pa.	Mohnton, A. G. Fox, ----	40	9.43	10.06	--------
		Average, --------------	--------	10.60	10.17	--------
	Chop Feeds.					
5594	Special Chop Feed, Altoona Grain and Feed Co., Altoona, **Pa.**	Altoona, Altoona Grain and Feed Co.	392	11.05	11.00	9.00
5928	Choice Mixed Chop, Anchor Roller Mills, Allentown, Pa.	Allentown, John E. Schuon,	75	10.04	12.94	8–10
5661	Royal Chop Feed, The Beck Cereal Co., Detroit, Mich.	Mt. Carmel, Schneider Bros. & Co.	459	10.35	8.88	10.00
5810	Crescent Corn and Oats Chop, T. M. Biddle, Altoona, Pa.	Juniata, R. I. Remaley, --	568	10.50	9.75	7.50
5620	Chop, W. N. Brosha, Jersey Shore, Pa.	Jersey Shore, W. N. Brosha.	418	10.95	11.25	--------
5414	Chop Feed, Buffalo Cereal Co., Buffalo, N. Y.	Kennett Square, W. H. Walker & Co.	212	8.80	8.44	7–8
5541	Corn, Oats and Barley Feed, Chesbro Milling Co., Salamanca, N. Y.	Du Bois, A. T. Sprankle,	339	9.79	9.13	8–10
5624	Mixed Chop, The City Mills, Muncy, Pa.	Muncy, Eaker & Vermilya,	422	10.16	10.75	7.19
5595	Ear Corn, Rye, Oats, Wheat Middlings, Forge Milling Co., Roaring Springs, Pa.	Altoona, The Big Diamond Flour and Feed Co.	393	8.67	10.63	--------
5564	Rye and Oats Chop, E. D. Fry, Cresson, Pa.	Cresson, E. D. Fry, ------	362	10.69	11.63	--------
5582	Pennsylvania Special Chop Feed, Globe Elevator Co., Buffalo, N. Y.	Morrisdale, Morrisdale Feed and Grain Co.	380	8.53	10.94	8–10
5962	Boss Chop Feed, The Great Western Cereal Co., Chicago, Ill.	Red Hill, O. D. Reiter, ---	91	8.33	9.31	8.00
5935	Mixed Chop, Jacob S. Haines, Allentown, Pa.	Macungie, Wm. M. Gehman.	82	10.27	12.25	7–12
5364	Chop, Hogsett & Hankins, Uniontown, Pa.	Uniontown, Hogsett & Hankins.	162	10.08	9.31	8.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.73	--------	3.30	--------	$1 40	Corn and oats, ----------	As certified, ------------	5568
4.78	--------	3.00	--------	1 35	Corn and oats, ----------	As certified, ------------	5527
4.00	--------	4.47	--------	1 45	Corn and oats, ----------	As certified, ------------	5713
4.20	--------	3.95	--------	1 35	Corn and oats, ----------	As certified, ------------	5638
4.28	--------	2.30	--------	1 25	Corn and oats chop, ----	As certified, ------------	5556
5.00	--------	3.05	--------	1 60	---------------------------	Corn and oats, --------	5804
4.41	--------	4.06	--------	29 29			
6.30	4.00	4.65	9.00	30 00	Oats, oat clippings, oat hulls, barley screenings, corn and ear corn, middlings,, hominy feed, low grade flour and about 3 lbs. of salt to the ton.	As certified, ------------	5594
5.65	4-6	3.92	3-4	1 70	Corn, rye feed and hominy.	As certified, ------------	5928
5.59	7.00	6.32	9.00	1 30	Corn, oat middlings, shorts and oat hulls.	As certified, ------------	5661
4.53	3.00	3.05	9.00	1 60	Corn, oats and hominy feed.	As certified, ------------	5810
3.80	--------	3.87	--------	1 50	Corn, oats and wheat screenings, or broken grains of wheat.	As certified, ------------	5620
4.45	3-4	10.19	6.00	1 30	Corn, hominy feed, oat bran and oat hulls.	As certified, ------------	5414
4.25	4-6	6.30	7-9	1 25	Corn, hominy, barley, oat shorts, oat hulls, oat middlings and ½ of 1 per cent. salt.	As certified, ------------	5541
3.60	3.30	6.07	9.00	25 00	Rye middlings, corn chop, barley feed and malt sprouts.	As certified, ------------	5624
3.60	--------	6.45	--------	1 50	Ear corn, rye, oats and wheat middlings.	As certified, ------------	5595
3.00	--------	3.90	--------	1 50	Rye and oats, -----------	As certified, ------------	5561
4.08	4-5	8.80	9.00	26 00	Hominy feed, flour middlings, ground corn and cob, oats and oat hulls and about 5 lbs. salt to the ton.	As certified, ------------	5582
4.00	3.50	8.70	9.00	25 00	Corn, hominy feed, oats, oat middlings, oat hulls and oat shorts. Maximum salt ¾ of 1 per cent.	As certified, ------------	5962
3.83	2-6	4.87	3-7	1 65	Corn, ear corn, rye middlings, hominy feed, wheat and oat chops.	As certified, ------------	5935
4.03	3.00	7.32	5.00	24 00	Corn, oats and oat hulls,	As certified, ------------	5364

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5609	Monarch Chop Feed, Husted Milling Co., Buffalo, N. Y.	Williamsport, F. W. Dawson.	407	9.01	9.88	7.5-9
5317	Monarch Chop Feed, Husted Milling Co., Buffalo, N. Y.	Lititz, Elmer Eby,	115	11.62	9.31	7.5-9
		Average,		10.31	9.60	
5601	Corn, Oats and Barley Chop, The Imperial Grain and Milling Co., Toledo, Ohio.	Altoona, Central Feed Co.,	399	9.59	8.94	8.90
5856	Corn, Oats and Barley Chop, The Imperial Grain and Milling Co., Toledo, Ohio.	Washington, Henry O. Meyers.	593	7.27	8.88	8.90
5698	Corn, Oats and Barley Chop, The Imperial Grain and Milling Co., Toledo, Ohio.	Blairsville, George J. New,	496	7.24	9.19	8.90
5462	Corn, Oats and Barley Chop, The Imperial Grain and Milling Co., Toledo, Ohio.	Leechburg, Stull-Hill-Coulter Co.	260	9.84	9.19	8.90
		Average,		8.49	9.05	
5358	Premium Chop, The Imperial Grain and Milling Co., Toledo, Ohio.	Uniontown, King Bros.,	156	11.15	9.63	8.00
5854	Premium Chop, The Imperial Grain and Milling Co., Toledo, Ohio.	Washington, Henry O. Myers.	591	7.15	9.13	8.00
5459	Premium Chop, The Imperial Grain and Milling Co., Toledo, Ohio.	Vandergrift, T. J. Rowley.	257	10.50	9.19	8.00
5461	Premium Chop, The Imperial Grain and Milling Co., Toledo, Ohio.	Leechburg, Stull-Hill-Coulter Co.	259	9.49	9.50	8.00
		Average,		9.57	9.36	
5955	Mixed Chop, M. M. Laudenslager, Emaus, Pa.	Emaus, Laudenslager & Geist.	84	10.41	11.25	7-12
5931	Mixed Chop, D. & A. Tuckenbach, Bethlehem, Pa.	Bethlehem, D. & A. Tuckenbach.	78	9.34	11.63	

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.53	3.5-4.5	7.70	7-9	$1 25	Corn, oats, oat hulls and ¾ of 1 per cent. salt.	As certified, ...	5609
5.28	3.5-4.5	6.05	7-9	22 80	Corn, oats, oat hulls and ¾ of 1 per cent. salt.	As certified, ...	5317
4.91	--------	6.88	--------	23 90			
3.93	3.70	9.05	9.00	1 65	Shelled and ear corn, oats, barley, wheat flour, oat middlings, oat bran, oat hulls, cottonseed meal and ¼ of 1 per cent. salt.	As certified, ...	5601
3.90	3.70	9.60	9.00	1 60	Shelled and ear corn, oats, barley, wheat flour, oat middlings, oat bran, oat hulls, cottonseed meal and ¼ of 1 per cent. salt.	As certified, ...	5856
4.15	3.70	8.70	9.00	26 00	Shelled and ear corn, oats, barley, wheat flour, oat middlings, oat bran, oat hulls, cottonseed meal and ¼ of 1 per cent. salt.	As certified, ...	5698
4.23	3.70	8.25	9.00	24 00	Shelled and ear corn, oats, barley, wheat flour, oat middlings, oat bran, oat hulls, cottonseed meal and ¼ of 1 per cent. salt.	As certified, ...	5462
4.05	--------	8.90	--------	28 75			
4.28	3.50	6.85	9.00	24 00	Shelled and ear corn, cottonseed meal, white hominy meal, oat middlings, oat bran, oat hulls and ¼ of 1 per cent. salt.	As certified, ...	5358
3.90	3.50	7.37	9.00	1 50	Shelled and ear corn, cottonseed meal, white hominy meal, oat middlings, oat bran, oat hulls and ¼ of 1 per cent. salt.	As certified, ...	5854
3.63	3.50	7.77	9.00	1 25	Shelled and ear corn, cottonseed meal, white hominy meal, oat middlings, oat bran, oat hulls and ¼ of 1 per cent. salt.	As certified, ...	5459
3.95	3.50	8.05	9.00	22 50	Shelled and ear corn, cottonseed meal, white hominy meal, oat middlings, oat bran, oat hulls and ¼ of 1 per cent. salt.	As certified, ...	5461
3.94	--------	7.51	--------	25 38			
4.73	2-6	4.95	3-10	1 60	Corn, ear corn, rye middlings, hominy feed and oats.	As certified, ...	5955
4.88	--------	4.07	--------	28 00	White corn, wheat screenings and corn screenings.	Corn, oats and corn and wheat screenings.	5931

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct
5808	Park City Chops, The Mollett Grain Co., Toledo, Ohio.	Altoona, The Big Diamond Flour and Feed Co.	566	9.62	9.69	8-9
5586	Park City Chops, The Mollett Grain Co., Toledo, Ohio.	Osceola Mills, F. Hirsh,--	384	10.63	9.00	--------
		Average, -------------	--------	10.12	9.35	--------
5956	Mixed Chop, Chas. A. Moyer, Emaus, Pa.	Emaus, Chas. A. Moyer,--	85	10.71	12.56	--------
5943	Chop, New Model Milling Co., Oil City, Pa.	Oil City, New Model Milling Co.	659	9.21	12.19	--------
5546	Corn, Oats and Rye Chop, C. H. Notter, Du Bois, Pa.	Du Bois, C. H. Notter, --	344	10.82	11.25	--------
5912	Special Chop, The Ohio Cereal Co., Circleville, Ohio.	McKeesport, E. P. Junker,	640	10.48	13.13	16.00
5519	Chop Feed, Olean Mills, Olean, N. Y.	Port Allegany, C. O. Neptune.	317	11.23	11.00	7-10
5347	Yellow Corn and Oat Hull Chop, O. P. Shoupe, Mt. Pleasant, Pa.	Mt. Pleasant, O. P. Shoupe.	145	12.54	9.19	6.00
5712	Fresh Ground Mixed Chop, D. D. Simison, Volant, Pa.	New Castle, Adolph Roth,	510	10.72	10.31	9.50
5340	Fresh Ground Chop, New Stanton Mills, New Stanton, Pa.	New Stanton, New Stanton Mills.	138	15.03	10.56	8.00
5883	Mixed Chop, Stapleton & McClain, Saxton, Pa.	Saxton, Stapleton & McClain.	620	`10.01	11.38	8-10
5496	C. O. & B. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	St. Marys, Hall, Kaul & Hyde Co.	294	9.92	8.25	7-9
5365	C. O. & B. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Uniontown, Harry Hagan,	163	11.34	8.31	7-9
5455	C. O. & B. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Apollo, L. Todd Owens.--	253	10.35	8.81	7-9
5938	C. O. & B. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Tionesta, G. W. Robinson Son.	654	9.81	8.50	7-9
5549	C. O. & B. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Clearfield, Ross & Woods,	347	10.54	8.56	7-9
5766	C. O. & B. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Penfield, Johnson & Overturf.	536	9.69	8.50	7-9
		Average, -------------	--------	10.27	8.49	--------
5885	C. O. B. K. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Saxton, W. H. Mosser, --	622	10.25	8.50	7-9

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
5.23	3.5-4.5	5.20	8.5-9	$1 50	Corn, oats and oat hulls,	As certified, ------------	5808
4.65	--------	6.05	--------	1 35	----------------------------	Corn, oat hulls and small amount of oats.	5586
4.94	--------	5.62	--------	1 43			
4.15	--------	3.67	--------	1 60	Corn, hominy, whole wheat and rye middlings.	As certified, ------------	5956
4.40	--------	5.32	--------	1 60	Corn, oats and wheat, --	As certified, ------------	5943
3.15	--------	3.57	--------	1 25	Corn, oats and rye, ----	As certified, ------------	5546
5.25	5.00	4.30	7.00	32 00	Low grade flour and white corn.	As certified, ------------	5912
3.70	2-5	5.10	8.00	1 30	Corn, hominy, barley and oat feed.	Corn, hominy, barley, oat middlings and oat hulls.	5519
3.83	2.00	4.95	8.00	22 00	Yellow corn and oats hulls.	As certified, ------------	5347
4.25	4.10	3.50	3.32	1 45	Corn, oats, wheat bran wheat middlings.	As certified, ------------	5712
3.78	3.00	2.97	5.00	23 00	Corn, oats, bran and wheat screenings.	As certified, ------------	5340
3.95	3-4	3.35	5-7	1 60	Corn, oats, wheat bran, rye and wheat screenings.	Corn, oats, wheat bran, rye and wheat screenings and small amount of corn cockle.	5883
3.90	3.5-4.5	5.65	6-8	1 40	White shelled corn, ear corn, barley, oats, oat middlings, oat shorts and oat hulls.	As certified, ------------	5493
3.70	3.5-4.5	5.50	6-8	26 00	White shelled corn, ear corn, barley, oats, oat middlings, oat shorts and oat hulls.	As certified, ------------	5365
3.75	3.5-4.5	6.70	6-8	26 00	White shelled corn, ear corn, barley, oats, oat middlings, oat shorts and oat hulls.	As certified, ------------	5455
3.63	3.5-4.5	6.30	6-8	1 60	White shelled corn, ear corn, barley, oats, oat middlings, oat shorts and oat hulls.	As certified, ------------	5938
3.95	3.5-4.5	5.77	6-8	1 40	White shelled corn, ear corn, barley, oats, oat middlings, oat shorts and oat hulls.	As certified, ------------	5549
3.35	3.5-4.5	5.85	6-8	1 75	White shelled corn, ear corn, barley, oats, oat middlings, oat shorts and oat hulls.	As certified, ------------	5766
3.71	--------	5.96	--------	29 17			
3.78	3.5-4.5	6.22	6-9	1 65	White shelled corn, ear corn, barley, wheat flour, oats, oat middlings, oat shorts and oat hulls.	As certified, ------------	5885

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5480	C. O. B. K. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Ridgway, Smith Bros. Co.,	278	10.15	8.69	7-9
		Average,		10.20	8.60	
5701	Keystone Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Clymer, Victor Trading Co.	499	10.48	9.31	7-9
5266	Keystone Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Zelienople, Fred Zehner,	64	10.52	8.63	7-9
		Average,		10.50	8.97	
6189	Little Wonder Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Wilmerding, Routh & Co.,	891	10.71	8.69	7-8
5745	M. D. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Reynoldsville, Fales Grocery Co.	527	9.23	9.19	7-9
5710	M. D. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	New Castle, Fisher & Mengle.	508	10.78	8.44	7-9
5366	M. D. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Uniontown, Harry Hagan,	164	10.33	9.31	7-9
5326	M. D. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Latrobe, Latrobe Wholesale Grocery Co.	124	11.16	8.50	7-9
5884	M. D. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Saxton, W. H. Mosser,	621	9.58	8.44	7-9
5454	M. D. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Apollo, L. Todd Owens,	252	10.87	8.44	7-9
6190	M. D. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Wilmerding, Routh & Co.,	892	10.01	8.81	7-9
5693	M. D. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Blairsville, Smith & McKelvey.	491	9.70	8.13	7-9
5581	M. D. Chop Feed, The Toledo Grain and Milling Co., Toledo, Ohio.	Munson Station, Jacob Smutzinger.	379	9.35	8.00	7-9
		Average,		10.11	8.58	
5579	Mixed Chop, Wolf's Mill, Philipsburg, Pa.	Philipsburg, Wolf's Mill,	377	10.50	12.25	4-9

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.65	3.5–4.5	6.20	6–8	$1 50	White shelled corn, ear corn, barley, wheat flour, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5480
3.72	....	6.21	....	1 58			
4.23	3.5–4.5	5.35	6–8	1 76	White shelled corn, ear corn, barley, wheat flour, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5701
4.00	3.5–4.5	4.80	6–8	26 00	White shelled corn, ear corn, barley, wheat flour, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5266
4.12	....	5.07	....	30 60			
3.93	3–4	5.15	7–9	1 75	White or yellow shelled corn, ear corn, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	6189
5.33	3.5–4.5	7.55	7–9	1 35	White or yellow shelled corn, ear corn, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5745
3.90	3.5–4.5	6.55	7–9	26 00	White or yellow shelled corn, ear corn, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5710
6.73	3.5–4.5	6.40	7–9	25 00	White or yellow shelled corn, ear corn, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5366
4.00	3.5–4.5	5.40	7–9	25 00	White or yellow shelled corn, ear corn, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5326
4.05	3.5–4.5	6.75	7–9	1 60	White or yellow shelled corn, ear corn, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5884
4.12	3.5–4.5	7.20	7–9	25 00	White or yellow shelled corn, ear corn, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5454
3.90	3.5–4.5	5.95	7–9	1 65	White or yellow shelled corn, ear corn, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	6190
3.98	3.5–4.5	7.00	7–9	26 00	White or yellow shelled corn, ear corn, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5693
3.33	3.5–4.5	7.92	7–9	24 00	White or yellow shelled corn, ear corn, oats, oat middlings, oat shorts and oat hulls.	As certified, ...	5581
4.37	....	6.76	....	27 00			
3.38	2–5	2.95	5–7.5	1 65	Corn, oats, rye and wheat middlings.	As certified, ...	5579

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
	PROPRIETARY POULTRY FOODS.					
				Per ct.	Per ct.	Per ct.
5524	Mixed CK. Feed, Acme Milling Co., Olean, N. Y.	Coudersport, Gates Bros.,	322	10.75	12.00	--------
5591	Aleeda Chicken Feed, Altoona Grain and Feed Co.,, Altoona, Pa.	Altoona, Altoona Grain and Feed Co.	389	9.57	11.19	9.00
5592	Chicken Scratch Feed, Altoona Grain and Feed Co., Altoona, Pa.	Altoona, Altoona Grain and Feed Co.	390	11.59	11.00	3.00
5828	Amco Hen Feed, American Milling Co., Chicago, Ill.	Millersburg, Millersburg Roller Mills.	57	10.72	12.50	10.00
5654	Blended Hen Food—The Great Egg Producer, Blank & Gottshall, Sunbury, Pa.	Sunbury, Blank & Gottshall.	452	11.28	10.63	8–10.5
5655	Chick Food Invigorator, Blank & Gottshall, Sunbury, Pa.	Sunbury, Blank & Gottshall.	453	9.55	10.69	8–10.5
5538	Chick Food Invigorator, Blank & Gottshall, Sunbury, Pa.	Lock Haven, F. H. Dyer,	336	9.16	11.56	8–10.5
		Average, --------------	--------	9.35	11.13	--------
5653	B. & G's Dry Mash Food—Great Egg Producer, Blank & Gottshall, Sunbury, Pa.	Sunbury, Blank & Gottshall.	451	8.01	12.50	10–11
5370	Bolgiano's Square Deal Chick Food, Bolgiano's Seed Store, Baltimore, Md.	Uniontown, W. S. Smith,--	168	10.21	10.31	10.01
5371	Bolgiano's Square Deal Chick Starter, Bolgiano's Seed Store, Baltimore, Md.	Uniontown, W. S. Smith,--	169	10.48	10.19	9.48
5886	Bolgiano's Square Deal Poultry Food, J. Bolgiano's & Son, Baltimore, Md.	Bedford, Davidson Bros.,--	623	10.55	11.06	11.50
5976	Rex Brand Pigeon Food, W. J. Byrnes & Co., Chicago, Ill.	Pittsburg, The I. W. Scott Co.	678	8.98	11.63	--------
6082	F. P. C. Developing Chick Feed, F. P. Cassel & Son, Lansdale, Pa.	Lansdale, F. P. Cassel & Son.	784	10.67	11.63	--------
6077	F. P. C. High Grade Pigeon Feed, F. P. Cassel & Son, Lansdale, Pa.	Lansdale, F. P. Cassel & Son.	779	10.82	12.69	11–12

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.88	--------	8.20	--------	$1 80	------------------------------	Corn, oats, wheat, barley, buckwheat, Kaffir corn, sunflower seed, grit and trace of corn cockle.	5524
5.38	4.00	8.05	9.00	1 75	Corn chop, bran, alfalfa, hominy feed, oil meal and Kaffir corn.	As certified, ------------	5591
3.05	2.00	2.92	9.00	2 00	Wheat, cracked corn, Kaffir corn, buckwheat and oats.	As certified, ------------	5592
3.00	3.00	2.55	5.00	2 50	Corn, wheat, barley, Kaffir corn, linseed oil cake, sunflower seed and buckwheat.	Corn, wheat, oats, barley, Kaffir corn, corn, linseed oil cake, sunflower seed and buckwheat.	5828
3.25	2.25-3	3.22	2.5-3.5	1 70	Cracked corn, wheat, Kaffir corn, buckwheat, barley, spelts, sunflower seed, hen-e-ta bone and charcoal.	Cracked corn, wheat, buckwheat, Kaffir corn, barley, spelts and sunflower seed.	5654
3.30	2.25-3	2.20	2.5-3.25	1 80	Cracked corn, cracked wheat, millet, hen-e-ta grit, cracked peas, Kaffir corn, milo maize flaxseed and charcoal.	As certified, ------------	5655
3.00	2.25-3	2.50	2.5-3.25	3 00	Cracked corn, cracked wheat, millet, hen-e-ta grit, cracked peas, Kaffir corn, milo maize and charcoal,	As certified, ------------	5538
3.15	--------	2.35	--------	2 40			
3.00	2-3	3.75	3-3.5	1 85	Corn meal, gluten meal, wheat middlings, wheat bran, pea meal and hen-e-ta bone.	As certified, ------------	5653
3.18	3.89	2.50	2.76	2 50	Corn, wheat, Kaffir, millet, rice and seeds.	Corn, wheat, Kaffir corn, millet and rice.	5370
3.50	4.14	2.52	2.70	2 50	Corn, wheat, Kaffir, millet, rice and seeds.	Corn, wheat, Kaffir corn, millet and rice.	5371
4.00	3.87	3.65	2.70	1 90	Wheat, corn, oats, barley, red and white Kaffir and seeds.	Corn, oats, barley, wheat, Kaffir corn, sunflower seed and small amount of weed seeds.	5886
2.95	--------	3.37	--------	2 40	------------------------------	Corn, wheat, buckwheat, millet, hemp seed, peas, Kaffir corn and grit.	5976
3.50	--------	2 50	--------	1 90	Corn, wheat, barley, buckwheat, bone, Kaffir corn, hulled oats, rice and millet.	As certified, ------------	6082
3.75	3-4	2.80	2-3	40 00	Corn, peas, buckwheat, Kaffir corn, millet, hempseed, flaxseed, hulled oats, canary seed, rape seed and wheat.	As certified, ------------	6077

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6081	F. P. C. Standard Poultry Mash Food, F. P. Cassel & Son, Lansdale, Pa.	Lansdale, F. P. Cassel & Son.	783	9.83	18.44	--------
6068	F. P. C. Standard Scratch Feed, F. P. Cassel & Son, Lansdale, Pa.	Colmar, C. R. Rosenberger,	770	10.52	11.25	10–11
6079	F. P. C. Standard Poultry Scratch Feed, F. P. Cassel & Son, Lansdale, Pa.	Lansdale, F. P. Cassel & Son.	781	11.33	10.75	10–11
5517	Chesbro's Trojan Chick Feed, Chesbro Milling Co., Salamanca, N. Y.	Bradford, Smith Bros., --	315	11.20	10.63	10.00
5516	Chesbro's Trojan Scratch Feed, Chesbro Milling Co., Salamanca, N. Y.	Bradford, Smith Bros., --	314	12.28	11.25	10.75
5807	Chicken Feed Wheat, George C. Christian & Co., Minneapolis, Minn.	Altoona, E. D. Clark, ----	565	11.12	14.75	--------
5598	E. D. Clark's Superior Hen Food, E. D. Clark, Altoona, Pa.	Altoona, E. D. Clark, ----	396	11.85	12.50	8.00
5805	E. D. Clark's Superior Hen Food, E. D. Clark, Altoona, Pa.	Altoona, E. D. Clark, ----	563	10.92	9.94	8.00
		Average, -------------	--------	11.38	11.22	--------
5599	Superior Chick Food, E. D. Clark, Altoona, Pa.	Altoona, E. D. Clark, ----	397	12.43	9.81	8.00
5404	Mixture—Arrow Chick Food, E. W. Conklin & Son, Inc., Binghamton, N. Y.	York, F. Z. Stauffer, -----	202	12.24	12.06	11.50
5403	Mixture—Arrow Egg Food, E. W. Conklin & Son, Inc., Binghamton, N. Y.	York, F. Z. Stauffer, ----	201	12.72	11.31	11.45
5606	Dayton's Ideal Scratch Grains, Dayton Milling Co., Towanda, Pa.	Williamsport, Gohl & King,	404	12.86	11.00	8–12
5544	Crescent Chick Feed With Grit, The Albert Dickinson Co., Chicago, Ill.	Du Bois, A. T. Sprankle,--	342	9.57	11.25	10.00
5449	Globe Scratch Feed, No Grit, The Albert Dickinson Co., Chicago, Ill.	West Bridgewater, W. W. McCullough.	247	10.75	11.25	10.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
5.28	--------	9.32	--------	$1 70	Corn meal, middlings, beef scraps, alfalfa meal, oats chop, cake meal, cottonseed meal, bran, gluten, charcoal and salt.	As certified, -----------	6081
3.58	3-4	2.65	2-3	2 25	Wheat, buckwheat, corn, Kaffir corn, oats, barley, flaxseed, millet, sunflower, bone and charcoal.	Wheat, buckwheat, corn, bone, Kaffir corn, oats, barley, flax seed, sunflower seed and millet.	6068
3.75	3-4	3.07	2-3	37 00	Wheat, buckwheat, corn, Kaffir corn, oats, barley, flaxseed, millet, sunflower seed and bone.	As certified, -----------	6079
3.18	2.70	2.50	--------	2 25	--------------------------	Corn, wheat, Kaffir corn, millet and peas.	5517
2.90	2.40	3.15	--------	1 80	--------------------------	Corn, oats, wheat, barley, buckwheat, Kaffir corn, peas and sunflower seed.	5516
3.55	--------	4.15	--------	--------	--------------------------	Wheat and a large amount of weed seeds.	5807
3.03	2.00	2.70	15.00	1 60	Cracked corn, buckwheat, Kaffir corn, rye, oats, wheat, sunflower seed, grit and oyster shell.	Cracked corn, buckwheat, Kaffir corn, rye, oats, wheat, sunflower seed, flaxseed, grit, oyster shells and a considerable proportion of weed seeds.	5598
3.15	2.00	2.57	15.00	1 90	Cracked corn, buckwheat, Kaffir corn, rye, oats, wheat, sunflower seed, grit and oyster shell.	Cracked corn, buckwheat, Kaffir corn, rye, oats, wheat, sunflower seed, flaxseed, grit, oyster shells and small amount of weed seeds.	5805
3.09	--------	2.63	--------	1 75			
3.05	2.00	1.95	15.00	1 60	Cracked corn, Kaffir corn, millet, wheat, grit and oyster shell.	As certified, -----------	5599
3.13	4.30	3.30	2.90	2 50	Corn, Kaffir corn, milo maize, wheat, millet and peas.	As certified, -----------	5404
4.23	3.85	4.15	7.50	2 10	Corn, wheat, Kaffir corn, buckwheat, milo maize, speltz, barley, peas, flax and sunflower seed.	As certified, -----------	5403
3.00	3-6	2.87	3-6	1 90	--------------------------	Corn, oats, barley, wheat, buckwheat, Kaffir corn and sunflower seed.	5606
3.23	2.50	3.07	5.00	2 25	Corn, wheat, Kaffir corn, hulled oats, millet and grit.	As certified, -----------	5544
3.23	2.50	3.45	5.00	1 80	Corn, wheat, barley, oats, Kaffir corn, buckwheat, sunflower and oil cake.	As certified, -----------	5449

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
6193	Globe Scratch Feed, The Albert Dickinson Co., Chicago, Ill.	Wilmerding, Routh & Co.,	895	11.93	12.38	10.00
		Average,	--------	11.34	11.82	--------
6194	Globe Scratch Feed With Grit, The Albert Dickinson Co., Chicago, Ill.	Wilmerding, Routh & Co.,	896	11.51	11.00	10.00
6040	Pine Tree Scratch Feed, No Grit, The Albert Dickinson Co., Chicago, Ill.	Corry, Acme Milling Co.,	742	10.74	10.94	10.00
5448	Pine Tree Scratch Feed, No Grit, The Albert Dickinson Co., Chicago, Ill.	West Bridgewater, W. W. McCullough.	246	10.45	10.81	10.00
		Average,	--------	10.59	10.88	--------
5442	Queen Poultry Mash, The Albert Dickinson Co., Chicago, Ill.	New Brighton, J. H. Hornby & Sons.	240	9.90	11.63	11.00
5379	Queen Poultry Mash, The Albert Dickinson Co., Chicago, Ill.	Charleroi, R. C. Mountser,	177	10.10	12.25	11.00
		Average,	--------	10.00	11.94	--------
5537	Dyer's Hen Feed, F. H. Dyer, Lock Haven, Pa.	Lock Haven, F. H. Dyer,	335	11.02	11.25	11.53
5625	Chick Food, Eaker & Vermilya, Muncy, Pa.	Muncy, Eaker & Vermilya,	423	11.45	10.38	8–10
5923	Red Comb Meal Mash—The Great Egg Maker, Edwards & Loomis Co., Chicago, Ill.	Carnegie, C. A. Foster,	651	8.18	15.88	15.00
5678	Red Comb Meal Mash—The Great Egg Maker, Edwards & Loomis Co., Chicago, Ill.	Wilkinsburg, Johnston & Smith.	476	10.05	17.50	15.00
		Average,	--------	9.11	16.69	--------
5948	Red Comb Poultry Feed, Edwards & Loomis Co., Chicago, Ill.	Franklin, J. H. Lavery,	664	10.41	10.94	10.00
5642	Hen Food, Elkland Milling Co., Elkland, Pa.	Wellsboro, Equity Co-Operative Exchange.	440	11.77	11.19	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.53	2.50	2.45	5.00	$2 10	Corn, wheat, barley, oats, Kaffir corn, buckwheat, sunflower and oil cake. No grit.	As certified, ------------	6193
3.38	--------	2.95	--------	1 95			
3.05	2.50	2.15	5.00	2 10	Corn, wheat, barley, oats, Kaffir corn, buckwheat, sunflower, oil cake, crushed shells and grit.	As certified, ------------	6194
3.63	2.50	2.90	6.00	1 80	Corn, wheat, barley, sunflower, oats, Kaffir corn and no grit.	As certified, ------------	6040
3.33	2.50	2.30	5.00	1 75	Corn, wheat, barley, sunflower, oats and Kaffir corn.	As certified, ------------	5448
3.48	--------	2.60	--------	1.78			
3.78	2.50	7.37	10.00	1 45	Corn, meal, middlings, bran, shorts, alfalfa meal, beef scraps and oil cake.	As certified, ------------	5442
4.08	2.50	5.55	10.00	1 80	Corn, meal, middlings, bran, shorts, alfalfa meal and beef scraps.	As certified, ------------	5379
3.93	--------	6.46	--------	1 63			
4.13	3.80	3.65	3.36	2 00	Cracked corn, buckwheat, wheat, Kaffir corn, sunflower seed and charcoal.	As certified. ------------	5537
3.00	3–7	2.05	22.73	1 85	Cracked corn, cracked Kaffir corn, cracked wheat, millet seed and fine oyster shells.	As certified. ------------	5625
4.45	4.00	7.00	8.00	2 00	Oatmeal, oil meal, corn meal, beef scraps, wheat bran, wheat middlings, alfalfa meal and not over 5 per cent. shell and 1 per cent. charcoal.	As certified. ------------	5923
4.73	4.00	7.57	8.00	2 00	Oat and oat meal, corn meal, beef scraps, wheat bran, wheat middlings, alfalfa meal and not over 5 per cent. shell and 1 per cent. charcoal.	As certified, ------------	5678
4.59	--------	7.28	--------	2 00			
3.58	2.50	2.82	5.00	2 00	Wheat, cracked corn, Kaffir corn, barley, oats, sunflower seed, buckwheat and not over 3 per cent. grit, 3 per cent. shell and 1 per cent. charcoal.	As certified. ------------	5948
3.63	--------	4.27	--------	1 50	----------------------------	Corn, oats, wheat, buckwheat, sunflower seed, grit and a small amount of weed seeds.	5642

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein. Found.	Crude Protein. Guaranteed.
				Per ct.	Per ct.	Per ct.
5285	Chick Feed, John W. Eshelman, Lancaster, Pa.	Lancaster, John W. Eshelman.	83	11.47	11.31	7-9
5286	Hen Feed, John W. Eshelman, Lancaster, Pa.	Lancaster, John W. Eshelman.	84	12.10	10.25	7-8
6134	Hen Feed, John W. Eshelman, Lancaster, Pa.	Elizabethtown, A. W. Martin.	836	12.25	10.88	7-9
5296	Pigeon Feed, John W. Eshelman, Lancaster, Pa.	Lancaster, John W. Eshelman.	94	12.20	12.00	8-9
5741	Blue Ribbon Little Chick Food, Globe Elevator Co., Buffalo, N. Y.	Lindsey, Lindsey Milling Co.	523	11.69	12.19	--------
5959	Sterling Chick Feed, The Great Western Cereal Co., Chicago, Ill.	Bowers, W. W. Feick, ---	88	11.83	13.44	10.00
5817	Sterling Chick Feed, The Great Western Cereal Co., Chicago, Ill.	Longsdorf, James P. Myers.	46	10.33	12.31	10.00
		Average, ----------------	--------	11.08	12.88	--------
5816	Sterling Scratch Feed, The Great Western Cereal Co., Chicago, Ill.	Longsdorf, James P. Myers.	45	10.72	11.75	10.00
5572	Sterling Scratch Feed, The Great Western Cereal Co., Chicago, Ill.	Philipsburg, Philipsburg Grist Mill Co.	370	10.93	11.69	10.00
5782	Sterling Scratch Feed, The Great Western Cereal Co., Chicago, Ill.	Somerset, Saylor & Woy,	552	10.95	11.06	10.00
		Average, ----------------	--------	10.86	11.50	--------
5896	Anchor Chick Feed, The Harrison-Johnson Company, Toledo, Ohio.	Oil City, Clyde D. Duffee,	633	12.25	11.44	11.00
5691	Anchor Chick Feed, The Harrison-Johnson Company, Toledo, Ohio.	Wilkinsburg, Wilkinsburg Milling Co.	489	10.51	10.88	11.00
		Average, ----------------	--------	11.38	11.16	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.20	3-5	3.12	2-3	$34 00	Cracked wheat, cracked corn, hominy, broken cereal plant, separated from wheat, Kaffir corn, cracked Kaffir corn, hulled oats, rice, millet, flaxseed and 5 per cent. grit and shell.	Cracked wheat, cracked corn, hominy, Kaffir corn, hulled oats, rice, millet, grit and shell.	5285
3.88	2-3	2.40	7-8	32 00	Cracked corn, buckwheat, wheat screenings, Kaffir corn, wheat, barley, sunflower, bone, flaxseed, millet and 5 per cent. grit and shell.	As certified, ----------	5286
3.95	2-5	2.85	5-7	1 80	Cracked corn, buckwheat, sunflower seed, broken cereal plant separated from wheat, Kaffir corn, poultry, bone, flaxseed and millet. 5 per cent. grit and shell.	Cracked corn, buckwheat, sunflower seed, wheat, Kaffir corn, poultry bone, flaxseed, millet, grit and shell.	6134
3.08	2-3	2.42	3-4	35 00	Millet, peas, cracked corn, wheat, barley, flaxseed, granulated bone, buckwheat, Kaffir corn, hulled oats and 2 per cent. grit and shell.	Millet, rice, cracked corn, wheat, flax seed, granulated bone, buckwheat, Kaffir corn, grit and shell.	5296
3.18	--------	2.60	--------	2 50	----------------------------	Corn, hulled oats, wheat, Kaffir corn, peas and millet.	5741
2.95	3.00	2.12	4.80	2 00	Cracked corn, oat groats, millet and unground seeds and grains.	Corn, oat groats, wheat, barley and millet.	5959
2.95	3.00	2.07	4.00	2 25	Cracked corn, oat groats, millet and unground seeds and grains.	Cracked corn, wheat, oat groats, Kaffir corn and millet.	5817
2.95	--------	2.09	--------	2 13			
3.40	3.00	2.32	4.00	2 25	Cracked corn, wheat, barley, Kaffir corn, oats and sunflower seeds.	Cracked corn, wheat, barley, Kaffir corn, oats, buckwheat and sunflower seeds.	5816
3.75	3.00	2.30	4.00	33 00	Cracked corn, wheat, barley, Kaffir corn, oats and sunflower seeds.	Cracked corn, wheat, barley, Kaffir corn, oats, buckwheat and sunflower seeds.	5572
3.50	3.00	2.40	4.00	2 25	Cracked corn, wheat, barley, Kaffir corn, oats and sunflower seeds.	Cracked corn, wheat, barley, Kaffir corn, oats, buckwheat and sunflower seeds.	5782
3.55	--------	2.34	--------	2 05			
2.01	3.50	2.15	3.35	2 25	Corn, wheat, Kaffir corn, oats, millet and bone meal.	As certified, ----------	5896
3.65	3.50	2.17	3.35	2 00	Corn, wheat, Kaffir corn, oats, millet, bone meal and grit.	Corn, wheat, oats, barley, Kaffir corn, millet, bone meal and grit.	5691
2.83	--------	2.16	--------	2 13			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5692	Anchor Developing Feed, The Harrison - Johnson, Company, Toledo, Ohio.	Wilkinsburg, Wilkinsburg Milling Co.	490	10.48	10.81	13.30
5869	Imperial Chicken Feed, Huntingdon Milling Co., Huntingdon, Pa.	Huntingdon, Huntingdon Milling Co.	606	11.11	11.44	--------
5634	Husted Laying Mash, Husted Milling Co., Buffalo, N. Y.	Troy, Snedeker & Mitchell,	432	11.09	17.25	15-17
5652	Husted Poultry Feed, Husted Milling Co., Buffalo, N. Y.	Knoxville, Deerfield Milling Co.	450	10.16	13.63	12-14
5916	John-Hen Poultry Feed, Keystone Commercial Co., Pittsburg, Pa.	McKeesport, Keystone Commercial Co.	644	9.34	9.88	10.00
5853	John-Hen Poultry Feed, Keystone Commercial Co., Pittsburg, Pa.	Washington, Henry O. Myers.	590	10.13	11.56	10.00
		Average, --------------	--------	9.73	10.72	--------
5669	Poultry Food, Kift Milling Co., Sunbury, Pa.	Sunbury, Kift Milling Co.,	467	11.91	11.56	10.00
5277	A No. 1 Poultry Grains, H. J. Klingler & Co., Butler, Pa.	Butler, H. J. Klingler & Co.	75	10.75	10.75	--------
5753	A No. 1 Poultry Grains, H. J. Klingler & Co., Butler, Pa.	Clarion, B. W. Thompson,	535	10.22	11.13	--------
		Average, --------------	--------	10.48	10.94	--------
5929	Ideal Hen Feed, H. B. Kratz & Co., Schwenksville, Pa.	Allentown, E. S. Koch, ---	76	10.65	11.06	--------
5282	L. & S. Hen Feed, Levan & Sons, Columbia, Pa.	Lancaster, Levan & Sons,	80	9.70	10.56	6-8
5742	Poultry Feed, Lindsey Milling Co., Lindsey, Pa.	Lindsey, Lindsey Milling Co.	524	11.13	10.75	--------
5776	Martin's Chick Feed, Martin & Co., Altoona, Pa.	Altoona, Martin & Co., --	546	10.34	12.63	12.00
5777	Martin's Mixed Poultry Feed, Martin & Co., Altoona, Pa.	Altoona, Martin & Co., --	547	10.76	11.69	12.75

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.10	4.95	2.90	2.50	$2 00	Wheat, corn, Kaffir corn, milo maize, buckwheat, millet, charcoal, flax and grit.	Wheat, corn, Kaffir corn, milo maize, buckwheat, millet, flax and grit.	5692
4.20	--------	5.80	--------	2 00	Cracked corn, Kaffir corn, millet seed and sunflower seed.	As certified, ----------	5869
5.00	3-4	4.75	6-8	1 75	Bran, middlings, corn, rolled oats and cottonseed meal.	As certified, ----------	5634
5.03	4-5	7.32	6-9	1 50	Bran, middlings, corn, gluten and alfalfa.	As certified, ----------	5652
3.20	2.50	3.17	2 00	35 00	Wheat, cracked corn, buckwheat, barley, Kaffir corn, oats, sunflower seed, charcoal, grit and oyster shell.	As certified, ----------	5916
3.38	2.50	2.72	2.00	2 20	Wheat, cracked corn, buckwheat, barley, Kaffir corn, oats, sunflower seed and charcoal.	As certified, ----------	5853
3.29	--------	2.94	--------	1 98			
3.08	3.00	3.10	5.00	1 80	Sunflower seed, Kaffir corn, wheat, oats, corn, buckwheat and bone.	As certified, ----------	5669
3.50	--------	3.20	--------	1 75	Pure grains, cracked corn and sunflower seed. No grit or screenings.	Corn, oats, barley, buckwheat, wheat, Kaffir corn and sunflower seed.	5277
3.53	--------	2.75	--------	1 75	Pure grains, cracked corn and sunflower seeds. No grit or screenings.	Corn, oats, barley, buckwheat, wheat, Kaffir corn and sunflower seed.	5753
3.52	--------	2.97	--------	1 75			
3.40	--------	2.52	--------	2 25	Cracked corn, wheat, barley, buckwheat, Kaffir corn and sunflower seeds.	Cracked corn, oats, wheat, barley, buckwheat, Kaffir corn and sunflower seed.	5929
3.20	2-3	3.70	5-6	1 75	Buckwheat, wheat, Kaffir corn, barley, sunflower seed, oats, cracked corn and 5 per cent. grit and shell.	As certified, ----------	5282
3.20	--------	3.20	--------	2 00	Cracked corn, Kaffir corn, wheat, buckwheat, barley and oats.	As certified, ----------	5742
3.23	3.00	2.00	2.00	3 25	Cracked corn, German millet, steel cut oats, cracked Canadian peas, cracked Kaffir corn, cracked rice and cracked wheat.	As certified, ----------	5776
2.95	2.90	3.45	3.69	2 40	Wheat, buckwheat, barley, oats, cracked corn, Kaffir corn, Canada peas and sunflower seed.	As certified, ----------	5777

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5463	Diamond Scratch Feed—No Grit. R. S. McCague, Pittsburg, Pa.	Kittanning, J. A. Gault Co.	261	11.19	11.13	10.50
5435	Diamond Scratch Feed (Grit), R. S. McCague, Pittsburg, Pa.	Pittsburg, R. S. McCague,	233	11.44	10.69	10.00
5911	Diamond Scratch Feed (Grit), R. S. McCague, Pittsburg, Pa.	Irwin, T. F. Wilson Co.,	639	10.10	9.88	10.00
		Average, -------------	--------	10.77	10.29	--------
5801	No. 1 Scratch Feed, Miner-Hillard Milling Co., Wilkes-Barre, Pa.	Robesonia, R. E. Leiss, --	37	10.38	10.75	--------
5924	Purity Poultry Mash, Miner-Hillard Milling Co., Wilkes-Barre, Pa.	Allentown, A. T. Stover Estate.	71	8.70	15.25	15–17
6020	Acme Mash Feed, Nickel Plate Elevator Co., Cleveland, Ohio.	Erie, D. J. Carroll, ------	722	8.56	16.81	18.56
5299	Sugarota Chick Feed, North West Mills Co., Winona, Minn.	Lancaster, Sprecher & Ganss.	97	11.78	11.81	13.50
5300	Sugarota Scratch Feed, North West Mills Co., Winona, Minn.	Lancaster, Sprecher & Ganss.	98	11.50	10.56	12.00
5545	Mixed Chicken Feed, C. H. Notter, Du Bois, Pa.	Du Bois, C. H. Notter, ---	343	11.32	12.94	--------
5770	Dry Mash, The Park & Pollard Co., Boston, Mass.	Tyrone, The Bayer-Gillam Co.	540	8.50	18.94	20–23
5610	Dry-Mash, The Park & Pollard Co., Boston, Mass.	Williamsport, F. W. Dawson & Son.	408	8.93	23.63	20.00
5732	Dry-Mash, The Park & Pollard Co., Boston, Mass.	Towanda, Dayton Milling Co.	9	8.43	19.25	20–23
5577	Dry-Mash, The Park & Pollard Co., Boston, Mass.	Philipsburg, Philipsburg Grist Mill Co.	375	10.31	18.81	20.00
5399	Dry-Mash, The Park & Pollard Co., Boston, Mass.	York, F. Z. Stauffer, -----	197	10.14	15.69	20.00
5540	Dry-Mash, The Park & Pollard Co., Boston, Mass.	Lock Haven, E. E. Wentz,	338	9.51	16.69	20.23
		Average, -------------	--------	9.30	18.84	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.50	3.50	3.57	4.00	$1 80	--------	Corn, oats, wheat, barley, buckwheat, Kaffir corn and sunflower seed.	5463
3.22	3.00	3.12	3.50	28 50	Corn, wheat, barley, buckwheat, grit, sunflower seed, wheat screenings and Kaffir corn.	Corn, oats, wheat, barley, buckwheat, Kaffir corn, sunflower seed, grit and trace of weed seeds.	5435
3.12	3.00	2.57	3.50	40 00	--------	Corn, oats, wheat, barley, buckwheat, Kaffir corn, sunflower seed and grit.	5911
3.17	--------	2.84	--------	34 25			
3.45	--------	3.85	--------	2 00	--------	Corn, oats, wheat, barley, buckwheat, Kaffir corn, sunflower seed and peas.	5801
5.58	6–7	8.45	8–10	2 35	Green peas, alfalfa meal, wheat middlings, buckwheat middlings, wheat bran, ground oats and hominy feed.	As certified, --------	5924
4.45	4.77	5.20	7.70	2 25	Beef scraps, hen-e-ta bone, oil meal, alfalfa, gluten meal, corn meal, barley flour and wheat bran.	As certified, --------	6020
3.40	3.50	2.72	12.00	2 25	Cracked wheat, cracked corn, millet and hulled oats.	As certified, --------	5299
3.50	3.50	1.95	12.00	2 00	Cracked corn, wheat, barley, oats, buckwheat, Kaffir corn and sunflower seed.	As certified, --------	5300
3.03	--------	2.62	--------	1 75	Whole and cracked grains consisting of wheat, corn and oats.	Corn, oats, wheat, flaxseed and a large proportion of weed seeds.	5545
3.68	3.00	9.35	--------	2 50	--------	Corn, oats, barley, alfalfa, wheat bran and middlings, fish, meat, bone and salt.	5770
4.68	3.00	7.30	10.00	2 50	Bran, middlings, corn, wheat, barley, alfalfa, fish, meat, bone and salt.	As certified, --------	5610
4.90	3.00	9.00	--------	2 50	--------	Corn, trace of oats, barley, wheat, alfalfa, wheat bran and middlings, fish, meat, bone and salt.	5732
3.08	3.00	6.25	10.00	4 00	Bran, middlings, corn, wheat, barley, alfalfa, fish, meat, bone and salt.	As certified, --------	5577
6.03	3.00	7.40	10.00	2 35	Bran, middlings, corn, wheat, barley, alfalfa, fish, meat, bone and salt.	As certified, --------	5399
3.75	3.00	8.12	--------	2 25	--------	Corn, wheat bran and middlings, barley, alfalfa, fish, meat, bone and salt.	5540
4.35	--------	7.40	--------	2 68			

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5731	Gritless Chick Food, The Park & Pollard Co., Boston, Mass.	Towanda, Dayton Milling Co.	8	10.15	15.69	10–13
5479	Gritless Chick Food, The Park & Pollard Co., Boston, Mass.	Ridgway, C. O. Salberg, --	277	12.55	15.56	13.77
5503	Gritless Chick Food, The Park & Pollard Co., Boston, Mass.	Kane, J. A. Stoll & Co.,	301	13.51	14.00	13.77
		Average, ----------------	--------	12.07	15.08	--------
5613	Growing Feed, The Park & & Pollard Co., Boston, Mass.	Williamsport, F. W. Dawson & Son.	411	10.49	13.56	10.00
5730	Growing Feed, The Park & & Pollard Co., Boston, Mass.	Towanda, Dayton Milling Co.	7	9.35	14.56	14–16
5397	Growing Feed, The Park & & Pollard Co., Boston, Mass.	York, F. Z. Stauffer, ----	195	12.25	15.19	14–15
		Average, ----------------	--------	10.70	14.44	--------
5729	Red Ribbon Chick Food, The Park & Pollard Co., Boston, Mass.	Towanda, Dayton Milling Co.	6	10.31	11.81	10.00
5478	Red Ribbon Chick Food, The Park & Pollard Co., Boston, Mass.	Ridgway, C. O. Salberg, --	276	12.75	12.31	10.00
5402	Red Ribbon Chick Food, The Park & Pollard Co., Boston, Mass.	York, F. Z. Stauffer, ----	200	13.02	11.19	10–12
		Average, ----------------	--------	12.02	11.77	--------
5614	Scratch Feed, The Park & Pollard Co., Boston, Mass.	Williamsport, F. W. Dawson & Son.	412	11.24	12.50	10.12
5728	Screened Scratch Feed, The Park & Pollard Co., Boston, Mass.	Towanda, Dayton Milling Co.	5	11.05	11.31	10.00
5308	Mash Feed, Fred Pontz, Lancaster, Pa.	Lancaster, Fred Pontz, ---	106	10.57	19.00	9.00
5350	Pritts' Dry Mash, J. E. Pritts, Scottdale, Pa.	Scottdale, J. E. Pritts, --	148	10.43	24.63	20–25
5504	Purina Chicken Chowder, Purina Mills, St. Louis, Mo.	Smethport, C. Herzog, ---	302	10.00	17.50	16.00
5226	Purina Chicken Chowder, Purina Mills, St. Louis, Mo.	Lebanon, Kurtz & Mayers,	26	9.40	17.50	16.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.03	2.77	2.60	--------	$2 50	--------------------------	Corn, wheat, rice, millet, canary seed, fish, small amount of weed seeds and trace of oats.	5731
3.20	2.77	3.00	--------	3 00	--------------------------	Corn, wheat, rice, millet, canary seed and dried fish.	5479
5.23	2.77	2.32	--------	2 25	--------------------------	Corn, wheat, rice, millet, canary seed, and dried fish.	5503
4.15	--------	2.64	--------	2 58			
3.78	3.50	3.67	5.00	2 50	Bran, middlings, corn, wheat, barley, alfalfa, fish, meat, bone and salt.	As certified, ----------	5613
3.83	3.5-4	5.40	--------	2 50	--------------------------	Corn, oats, barley, wheat bran and middlings, fish, meat, bone and salt.	5730
3.78	3.5-4	3.07	--------	2 35	--------------------------	Corn, oats, barley, wheat bran and middlings, fish, meat bone and salt.	5397
3.80	--------	4.04	--------	2 45			
3.65	3.00	2.05	--------	2 00	--------------------------	Corn, hulled oats, wheat, Kaffir corn, millet and rice.	5729
3.50	3.00	1.57	--------	2 50	--------------------------	Corn, oats, wheat, buckwheat, Kaffir corn, rice and trace of weed seeds.	5478
3.40	3.50	1.80	5.00	2 25	Cracked corn, wheat, rice, oats and millet.	As certified, ----------	5402
3.52	--------	1.80	--------	2 25			
3.50	3.50	2.55	5.00	2 00	Cracked corn, wheat, buckwheat, barley, oats, charcoal and sunflower seed.	Cracked corn, wheat, oats, barley, buckwheat and sunflower seed.	5614
3.65	3.00	2.75	--------	2 00	--------------------------	Corn, oats, barley, wheat, sunflower seed, Kaffir corn and buckwheat.	5728
5.23	4.00	7.75	9.00	1 90	Wheat bran, wheat middlings, oil meal, alfalfa, meat scraps and corn chop.	As certified, ----------	5308
5.65	3.5-6	8.35	9-14	2 50	Beef scraps, alfalfa meal, cottonseed meal, pure corn chop, ground wheat, ground oats, charcoal, oil meal, wheat bran and wheat middlings.	As certified, ----------	5350
4.60	2.50	7.65	9.00	2 94	Alfalfa meal, corn meal, bran, middlings, linseed meal, granulated meat and charcoal.	As certified, ----------	5504
4.30	2.50	8.02	11.50	1 85	Alfalfa meal, corn meal, bran, middlings, linseed meal, bone meal, granulated meat and charcoal.	As certified, ----------	5226

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6121	Purina Chicken Chowder, Purina Mills, St. Louis, Mo.	Chester, T. Frank McCall,	823	9.31	19.88	16.00
5867	Purina Chicken Chowder, Purina Mills, St. Louis, Mo.	Washington, Adam Zelt & Sons.	604	9.16	17.63	16.00
		Average, ----------	--------	9.46	18.13	--------
5332	Purina Mill Feed, Chick Size, Purina Mills, St. Louis, Mo.	Greensburg, W. N. Davis,	130	12.06	11.56	11.00
5224	Purina Mill Feed, Chick Size, Purina Mills, St. Louis, Mo.	Lebanon, Kurtz & Mayers,	24	12.13	11.06	11.00
5303	Purina Mill Feed, Chick Size, Purina Mills, St. Louis, Mo.	Lancaster, Sprecher & Ganss.	101	12.18	12.00	11.0
5391	Purina Mill Feed, Chick Size, Purina Mills, St. Louis, Mo.	York, Strayer Bros. Co.,	189	11.45	11.18	11.00
		Average, ----------	--------	11.95	11.63	--------
6123	Purina Mill Feed, Pigeon Size, Purina Mills, St. Louis, Mo.	Chester, T. Frank McCall,	825	10.60	13.44	11.00
5304	Purina Mill Feed, Pigeon Size, Purina Mills, St. Louis, Mo.	Lancaster, Sprecher & Ganss.	102	12.07	13.06	11.00
		Average, ----------	--------	11.33	13.25	--------
5333	Purina Mill Feed, Scratch Size, Purina Mills, St. Louis, Mo.	Greensburg, W. N. Davis,	131	11.75	11.63	11.00
5225	Purina Mill Feed, Scratch Size, Purina Mills, St. Louis, Mo.	Lebanon, Kurtz & Mayers,	25	11.02	11.13	11.00
5481	Purina Mill Feed, Scratch Size, Purina Mills, St. Louis, Mo.	Ridgway, Smith Bros. Co.,	279	11.96	11.63	11.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.75	2.50	7.05	9.00	$2 25	Alfalfa meal, corn meal, bran middlings, linseed meal, granulated meat and charcoal.	As certified, ----------	6121
4.85	2.50	6.77	9.00	2 50	Alfalfa meal, corn meal, bran middlings, linseed meal, graunlated meat and charcoal.	As certified, ----------	5867
4.63	--------	7.37	--------	2 39			
3.93	3.60	2.67	4.00	2 30	Wheat, corn, millet, Kaffir, milo maize, re-cleaned miscellaneous seeds.	Corn, wheat, millet, Kaffir corn and milo maize and a large proportion of weed seeds.	5232
3.80	3.60	2.35	4.00	2 00	Wheat, corn, millet, Kaffir, milo maize, re-cleaned miscellaneous seeds.	Corn, wheat, millet, Kaffir corn, milo maize and a large proportion of weed seeds.	5224
3.48	3.50	2.75	4.00	2 00	Wheat, corn, millet, Kaffir, milo maize, re-cleaned miscellaneous seeds.	Corn, wheat, millet, Kaffir corn, milo maize and a large proportion of weed seeds.	5303
3.95	3.60	3.00	4.00	2 15	Wheat, corn, millet, Kaffir, milo maize, re-cleaned miscellaneous seeds.	Corn, wheat, millet, Kaffir corn, milo maize and a large proportion of weed seeds.	5391
3.79	--------	2.69	--------	2 11			
2.74	3.60	2.75	4.00	2 50	Wheat, corn, millet, Kaffir, milo maize, peas, re-cleaned miscellaneous seed.	Corn, wheat, millet, Kaffir corn, milo maize, peas and weed seeds.	6123
3.28	3.60	3.00	4.00	2 50	Wheat, corn, millet, Kaffir, milo maize, peas, re-cleaned miscellaneous seed.	Corn, wheat, millet, Kaffir corn, milo maize, peas and a large proportion of weed seeds.	5304
3.01	--------	2.87	--------	2 50			
3.58	3.60	2.70	4.00	2 00	Wheat, corn, barley, Kaffir, milo maize, sunflower, re-cleaned miscellaneous seeds.	Corn, oats, wheat, barley, Kaffir corn, milo maize, sunflower seed and a large proportion of weed seeds.	5333
3.60	3.60	3.12	4.00	1 85	Wheat, corn, oats, barley, Kaffir, milo maize, sunflower, re-cleaned miscellaneous seeds.	Corn, oats, wheat, barley, Kaffir corn, milo maize, sunflower seed and a large proportion of weed seeds.	5225
3.90	3.60	2.55	4.00	2 25	Wheat, corn, oats, barley, Kaffir, milo maize, sunflower, re-cleaned miscellaneous seeds.	Corn, oats, wheat, barley, Kaffir corn, milo maize, sunflower seed and a large proportion of weed seeds.	5481

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5392	Purina Mill Feed, Scratch Size, Purina Mills, St. Louis, Mo.	York, Strayer Bros. Co.,	190	10.97	12.69	11.00
		Average. -------------	--------	11.42	11.77	--------
6184	American Hen Scratching Grains, The Quaker Oats Co., Chicago, Ill.	Jeannette, Keystone Supply Co.	886	10.23	11.25	10.00
5993	American Hen Scratching Grains, The Quaker Oats Co., Chicago, Ill.	Braddock, Marriott & Sons.	695	10.54	10.81	10.00
6195	American Hen Scratching Grains, The Quaker Oats Co., Chicago, Ill.	Wilmerding, Routh & Co.,	897	10.38	11.00	10.00
5880	American Hen Scratching Grains, The Quaker Oats Co., Chicago, Ill.	Hopewell, M. V. Zeth, ----	617	10.46	10.31	10.00
		Average. -------------	--------	10.40	10.84	--------
5452	Schumacher Little Chick Feed, The Quaker Oats Co., Chicago, Ill.	Monaca, Allen Davidson, --	250	10.28	11.13	10.00
6152	American Poultry Feed, The Quaker Oats Co., Chicago, Ill.	Lewistown, Lewistown Ice and Storage Co.	854	10.73	14.00	12.00
5450	Schumacher Scratching Grains—No Grit, The Quaker Oats Co., Chicago, Ill.	Monaca, Allen Davidson,--	248	10.88	11.69	10.00
5339	Schumacher Scratching Grains, The Quaker Oats Co., Chicago, Ill.	Greensburg, Harry Orr & Co.	137	10.43	12.00	10.00

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.45	3.60	3.22	4.00	$1 90	Wheat, corn, barley, oats, Kaffir, milo maize, sunflower, recleaned miscellaneous seeds.	Corn, oats, wheat, barley, Kaffir corn, milo maize, sunflower seed and a large proportion of weed seeds.	5392
3.63	--------	2.89	--------	2 00			
3.60	2.50	2.67	5.00	2 00	Wheat, barley, oats, Kaffir corn, buckwheat, corn and sunflower seeds, with not to exceed 6 per cent. marble grit and ½ of 1 per cent. poultry charcoal.	As certified, ----------	6184
3.48	2.50	2.50	5.00	2 15	Wheat, barley, oats, Kaffir corn, buckwheat, corn and sunflower seeds, with not not to exceed 6 per cent. marble grit and ½ of 1 per cent. poultry charcoal.	As certified, ----------	5993
3.40	2.50	2.30	5.00	2 10	Wheat, barley, oats, Kaffir corn, buckwheat, corn and sunflower seeds, with not not to exceed 6 per cent. marble grit and ½ of 1 per cent. poultry charcoal.	As certified, ----------	6195
3.68	2.50	3.07	5.00	2 00	Wheat, barley, oats, Kaffir corn, buckwheat, corn and sunflower seeds, with not to exceed 6 per cent. marble grit and ½ of 1 per cent. poultry charcoal.	As certified, ----------	5880
3.54	--------	2.63	--------	2.06			
3.30	2.50	3.02	5.00	2 10	Corn, rye, millet, Kaffir corn and wheat, with not to exceed ½ of 1 per cent. poultry charcoal and 6 per cent. marble grit.	As certified, ----------	5452
4.78	3.50	4.60	9.00	2 00	Corn, barley, cottonseed meal and wheat bran.	As certified, ----------	6152
4.70	2.50	2.92	5.00	1 85	Wheat, oats, barley, Kaffir corn, buckwheat, corn and sunflower seeds, with not to exceed ½ of 1 per cent. poultry charcoal.	As certified, ----------	5450
3.63	2.50	2.75	5.00	2 00	Wheat, oats, barley, Kaffir corn, buckwheat, corn and sunflower seeds, with not to exceed ½ of 1 per cent. poultry charcoal.	As certified, ----------	5339

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5927	Schumacher Scratching Grains, The Quaker Oats Co., Chicago, Ill.	Allentown, Geo. B. Shelly Est.	74	10.16	11.88	10.00
		Average,		10.49	11.86	
6122	Chicken Feed, Chick Size, Ralston Purina Company, St. Louis, Mo.	Chester, T. Frank McCall,	824	10.92	12.19	11.00
5866	Chicken Feed, Chick Size, Ralston Purina Company, St. Louis, Mo.	Washington, Adam Zelt & Sons.	603	10.35	12.06	11.00
		Average,		10.63	12.13	
5715	Chicken Feed, Scratch Size, Ralston Purina Co., St. Louis, Mo.	New Castle, P. Wagner & Son.	513	10.47	11.13	11.00
5865	Chicken Feed, Scratch Size, Ralston Purina Co., St. Louis, Mo.	Washington, Adam Zelt & Sons.	602	10.80	10.69	11.00
		Average,		10.63	10.91	
5467	Red Hen Scratch Feed, Saginaw Milling Co., Saginaw, Mich.	Kittanning, J. A. Gault Co.	265	12.40	10.56	11-13
5889	Premier Scratch Feed, Scobie & Parker Co., Pittsburg, Pa.	Everett, Calvin Howard,	626	10.31	11.50	10.95
5980	Premier Scratch Feed, Scobie & Parker Co., Pittsburg, Pa.	Pittsburg, Scobie, Parker Co.	682	11.39	11.38	10.95

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
4.00	2.50	3.50	5.00	$2 15	Wheat, oats, barley, Kaffir corn, buckwheat, corn and sunflower seeds, with not to exceed ½ of 1 per cent. poultry charcoal.	As certified, ----------	5927
4.11	--------	3.05	--------	2 00			
4.15	3.60	2.75	4.00	2 50	Made from natural grain, corn, wheat, Kaffir or milo maize, millet and re-cleaned broken grains of cereal plants separated from wheat, barley and flax screenings.	Corn, oats, wheat, Kaffir or milo maize, millet, screenings, separated from wheat, barley and flax, containing a large amount of weed seeds.	6122
3.83	3.60	2.40	4.00	2 50	Made from natural grain, corn, wheat, Kaffir or milo maize, millet and re-cleaned broken grains of cereal plants separated from wheat, barley and flax screenings.	Corn, wheat, Kaffir or milo maize, millet, screenings, separated from wheat, barley and flax and containing a large proportion of weed seeds.	5866
3.99	--------	2.57	--------	2 50			
3.80	3.60	2.75	4.00	2 00	Made from natural grain, corn, barley, wheat, Kaffir or milo maize, sunflower and re-cleaned broken grains of cereal plants separated from wheat, barley and flax screenings.	Corn, barley, wheat, Kaffir or milo maize, sunflower seed, screenings, separated from wheat, barley and flax, including a large amount of weed seeds.	5715
3.45	3.60	2.25	4.00	2 20	Made from natural grain, corn, barley, wheat, Kaffir or milo maize, sunflower and re-cleaned broken grains of cereal plants separated from wheat, barley and flax screenings.	As certified, ----------	5865
3.63	--------	2.50	--------	2 10			
3.30	2.5-3	2.37	4-5	1 90	Wheat, Kaffir corn, buckwheat, corn, peas, millet, barley and sunflower seed.	Wheat, oats, Kaffir corn, buckwheat, corn, peas, barley and sunflower seed.	5467
3.95	4.40	3.20	5.85	60 00	Wheat, corn, barley, Kaffir corn, milo, buckwheat and sunflower seed.	Corn, wheat, barley, Kaffir corn, milo maize, buckwheat, sunflower seeds and linseed meal.	5889
3.73	4.40	2.10	5.85	36 00	Wheat, corn, barley, Kaffir corn, milo, buckwheat and sunflower seed.	Corn, oats, wheat, barley, Kaffir corn, milo maize, buckwheat, sunflower seed and linseed meal.	5980

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
5981	Premier Scratch Feed, Scobie & Parker Co., Pittsburg, Pa.	Pittsburg, Scobie & Parker Co.	683	10.25	11.31	10.95
		Average, --------------	--------	10.65	11.40	--------
6007	Excello Poultry Grains, Sherman Milling Co., Meadville, Pa.	Meadville, Sherman Milling Co.	709	11.51	10.75	--------
6016	Goverment Mash, George L. Siegel, Erie, Pa.	Erie, George L. Siegel, ---	718	8.72	18.25	16.00
6109	Snyder's Scratch Feed, Geo. S. Snyder Est., Hatfield, Pa.	Hatfield, George S. Snyder Est.	811	11.53	23.31	--------
5871	Dry Mash for Poultry, Spanogle-Yeager Milling Co., Lewistown, Pa.	Huntingdon, J. Stouffer,--	608	9.13	24.56	--------
5605	Spratts' Chicgrain, Spratts Patent (Am.), Ltd., Newark, N. J.	Williamsport, Gohl & King,	403	10.43	17.50	--------
5718	Steinmesch Mixed Feed, Hen Size, Steinmesch Feed Co., St. Louis, Mo.	New Castle, Marshall Bros.,	516	8.85	11.00	12.00
5719	Steinmesch Mixed Feed, Hen Size, Steinmesch Feed Co., St. Louis, Mo.	New Castle, Marshall Bros.,	517	9.25	11.63	12.00
		Average, --------------	--------	9.05	11.32	--------
6050	Suco Hen Feed, The Sugarine Co., Chicago, Ill.	Doylestown, M. E. Yost,--	752	11.37	11.44	10.00
5261	Excelsior Chicken Feed, Swope Bros., Johnstown, Pa.	Johnstown, Swope Bros.,--	61	9.94	10.19	8.00
5482	Victor Poultry Food, Victor Mills, Springville, N. Y.	Ridgway, Smith Bros. Co.,	280	12.82	10.63	--------
5788	White Oak Chick Feed, The White Oak Milling Co., Inc., Holsopple, Pa.	Somerset, John G. Emert,	558	11.13	11.31	11.00
5789	White Oak Scratch Feed, White Oak Milling Co., Inc., Holsopple, Pa.	Somerset, John G. Emert,	559	10.22	11.25	11.03
6048	Chick Feed, M. E. Yost, Doylestown, Pa.	Doylestown, M. E. Yost,--	750	10.33	13.13	--------

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.61	4.40	2.10	5.85	$34 50	Wheat, corn, barley, Kaffir corn, milo, buckwheat, sunflower seed and grit.	Corn, oats, wheat, barley, Kaffir corn, milo maize, buckwheat, sunflower seed, linseed oil meal and grit.	5981
3.76	--------	2.46	--------	43 33			
4.00	--------	2.95	--------	34 00	Cracked corn, wheat, buckwheat, oats, Kaffir corn, sunflower seed and oyster shell.	As certified. ----------	6007
5.05	4.50	8.35	9.25	1 90	Beef scrap, alfalfa meal, oil meal, oats, corn bran and shorts.	As certified. ----------	6016
3.50	--------	4.42	--------	1 85	Wheat, cracked corn, oats, sunflower seed, buckwheat, millet and Kaffir corn.	As certified. ----------	6109
5.70	--------	6.65	--------	2 50	Mill feed, corn products, beef scraps, oil meal and alfalfa meal.	As certified. ----------	5871
4.53	--------	3.92	--------	3 00	--------------------------	Corn, oats, wheat, peas, hemp seed, Kaffir corn, rice, millet, canary seed, flaxseed, meat, charcoal, oyster shells, grit and considerable proportion of weed seeds.	5605
3.43	3.00	3.12	6.00	2 25	Made of field grains and field seeds.	Corn, oats, barley, wheat, Kaffir corn, peas, bird millet, grit and a large amount of bindweed.	5718
3.13	3.00	2.80	6.00	2 65	Field grains and field seeds.	Corn, oats, barley, wheat, Kaffir corn, milo maize, rice, flaxseed, grit and a large amount of weed seeds.	5719
3.28	--------	2.96	--------	2 45			
3.18	3.00	2.97	5.00	2 10	Corn, wheat, barley, Kaffir corn, linseed oil cake, sunflower seed and buckwheat.	As certified. ----------	6050
3.03	2.00	5.62	8.00	2 00	Corn, Kaffir corn, buckwheat, wheat, oats, barley, sunflower seed, milo maize, grit and oyster shells.	As certified. ----------	5261
3.25	--------	4.05	--------	1 90	Mixed grains. -----------	Corn, oats, barley, wheat, buckwheat, Kaffir corn, sunflower seed and a small amount of chaff and weed seeds.	5482
3.18	3.04	1.43	2.76	2 50	--------------------------	Corn, oats, wheat, rice and Kaffir corn.	5788
3.68	3.05	3.07	3.43	2 20	--------------------------	Corn, oats, buckwheat and Kaffir corn.	5789
3.08	--------	2.27	--------	2 50	Cracked corn, cracked Kaffir corn, cracked Canada peas, cracked wheat, pin-head oat meal, cracked rice and millet.	As certified. ----------	6048

TABLE VII.—ANALYSES OF SAMPLES OF

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein.	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct.
6049	Perfection Mash Feed, M. E. Yost, Doylestown, Pa.	Doylestown, M. E. Yost,--	751	7.82	16.25	--------
6047	Yost's Life Saver Little Chick Food, M. E. Yost, Doylestown, Pa.	Doylestown, M. E. Yost,--	749	9.71	12.38	--------
	ANIMAL BY-PRODUCTS.					
6143	3 Medal Poultry Meat, The Berg Co., Philadelphia, Pa.	Elizabethtown, E. H. Lehman.	845	7.18	59.25	50–55
5292	Poultry Meat, Berg & Co., Philadelphia, Pa.	Lancaster, John W. Eshelman.	90	8.33	52.93	50–55
5951	Darling's Pure Ground Beef Scraps for Poultry, Darling & Co., Chicago, Ill.	Oil City, Oil City Milling Co.	667	5.64	55.00	55–65
5291	Ground Beef Scrap for Poultry, The Fritz Co., Philadelphia, Pa.	Lancaster, John W. Eshelman.	89	7.62	45.44	50–55
5487	Beef Scrap, Model Milling Co., Buffalo, N. Y.	Warren, T. N. Dunham,--	285	5.07	66.94	63.00
6041	Syracuse Cooked Meat Scraps, Syracuse Rendering Co., Syracuse, N. Y.	Corry, Acme Milling Co.,--	743	7.73	38.23	40–50
5738	Brehm's Beef Scrap, Waterloo Soap Works, Waterloo, N. Y.	New Albany, F. T. Mynard.	15	10.03	37.27	40–50
	CONDIMENTAL STOCK AND POULTRY FOODS.					
5328	Blue Grass Matchless Egg Maker, Blue Grass Co., Harrisburg, Pa.	Latrobe, Latrobe Wholesale Grocery Co.	126	9.92	20.38	21.00
6076	F. P. C. Chick Manna, F. P. Cassel & Son, Lansdale, Pa.	Lansdale, F. P. Cassel & Son.	778	9.40	13.38	12–14
5372	F. P. C. Chick Manna, F. P. Cassel & Son, Lansdale, Pa.	Uniontown, W. S. Smith.	170	9.12	14.06	12–14

FEEDING STUFFS COLLECTED IN 1911.—Continued.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
3.70	--------	7.52	--------	$1 85	Bran, alfalfa, charcoal, middlings, granulated corn meal, gluten, crushed oats, ground buckwheat, oil cake meal, beef scraps, oyster shell and ¼ of 1 per cent. salt.	As certified, ----------	6049
2.45	--------	3.15	--------	7 00	Pin-head oat meal, granulated corn meal, cracked Canada peas, cracked wheat, fine cracked Kaffir corn, millet, nutrium salts, charcoal and fine cracked rice.	Pin-head oat meal, corn meal, cracked Canada peas, cracked wheat, cracked Kaffir corn, cracked rice, millet and charcoal.	6047
13.03	13–15	2.00	1–3	2 75	--------------------------	Meat scraps, ---------	6143
12.44	13–15	2.19	1–3	50 00	--------------------------	Meat scraps and bone,	5292
10.55	10.00	2.80	2.50	4 00	--------------------------	Beef scraps, ----------	5951
14.68	10–12	0.97	1.00	50 00	Pure ground beef cracklings.	As certified, ----------	5291
10.35	10.00	1.85	--------	3 50	--------------------------	Beef scraps, ---------	5487
11.98	8–12	1.23	--------	3 00	--------------------------	Meat scraps, ---------	6041
23.80	15–20	1.19	--------	3 00	--------------------------	Beef scraps and bone,	5738
6.55	6.11	3.25	4.07	*0 50	Medicated corn, wheat, oats, bone, beef scraps, millet, alfalfa, juniper, elm, ginger and petrol.	Corn, wheat, oats, bone, beef scrap, millet, alfalfa, juniper, elm, ginger, petrol and small amount of weed seeds.	5328
4.53	4–5	1.77	2–3	6 30	Special prepared corn, oats and wheat middlings, crackers, gentian, ginger, chalk, aniseseed, ferrous sulphate, salt, sulphur, starch, meat and bone.	As certified, ----------	6076
3.66	4–5	1.77	2–3	10 00	Special prepared corn, oats and wheat middlings, crackers, gentian, ginger, chalk, aniseseed, ferrous, sulphate, salt, sulphur, starch, meat and bone.	As certified, ----------	5372

*Per package.

TABLE VII.—ANALYSES OF SAMPLES O

Chief Chemist's number.	Name of Feeding Stuff and Name and Address of Manufacturer or Importer.	Sampled at	Agent's number.	Moisture.	Crude Protein	
					Found.	Guaranteed.
				Per ct.	Per ct.	Per ct
6080	F. P. C. High Grade Poultry Mash Food, F. P. Cassel & Son, Lansdale, Pa.	Lansdale, F. P. Cassel & Son.	782	8.91	20.31	17-
6083	F. P. C. Success Chick Feed, F. P. Cassel & Son, Lansdale, Pa.	Lansdale, F. P. Cassel & Son.	785	10.98	11.38	11-1
5445	"Chickseat," Champion Manufacturing Co., Barto, Pa.	New Brighton, M. H. Stager.	243	9.37	13.44	12.0
5682	Conkey's Laying Tonic, The G. E. Conkey Co., Cleveland, Ohio.	Wilkinsburg, Johnston & Smith.	480	9.27	5.31	-------
6129	Little Giant Stock Food, Little Giant Food Co., Newark, N. J.	Ambler, J. Watson Craft,	831	9.50	21.69	21-2
5689	Pratt's Conditioner for Horses and Cattle, Pratt Food Co., Philadelphia, Pa.	Monongahela, D. E. Gamble.	487	8.52	11.50	-------
6114	Pratt's Egg Producer, Pratt's Food Co., Philadelphia, Pa.	Chester, John Thompson,--	816	7.60	12.19	-------
6113	Rust's Egg Producer, William Rust & Sons, New Brunswick, N. J.	Chester, John Thompson,--	815	5.75	17.94	-------
5978	Premier Egg Food, Scobie & Parker Co., Pittsburg, Pa.	Pittsburg, Scobie & Parker,	680	6.87	43.75	-------

FEEDING STUFFS COLLECTED IN 1911.—Concluded.

Crude Fat.		Crude Fiber.		Price per ton or cwt.	Certified Composition.	Identified by Microscopical Examination.	Chief Chemist's number.
Found.	Guaranteed.	Found.	Guaranteed.				
Per ct.	Per ct.	Per ct.	Per ct.				
5.63	4–5	9.87	10–12	$1 80	Bran, alfalfa meal, corn meal, oats chop, middlings, cake meal, beef scraps, charcoal, gluten, cottonseed meal, salt, sulphur, gentian, sulphate iron and ginger.	As certified, ...	6080
3.10	3–4	2.22	2–3	2 00	Kaffir corn, corn, cracked wheat, steel cut oat meal, bone, millet, aniseseed in powdered form to give odor.	As certified, ...	6083
4.43	2.00	1.87	2.00	8 33	Dried bone meal, dried beef and bone, baked and kiln dried rolled wheat, calsite, cracked wheat, hominy, sulphur, foenugreek and ginger.	As certified, ...	5445
7.08	....	28.72	....	*0 25	....	Gentian, pepper, sulphur, charcoal, Epsom salt, iron oxide, sodium carbonate.	5682
9.25	9–12	17.10	14–15	20 00	Sterilized meat meal, sterilized bone flour, sterilized ground blood, C. P. charcoal, imported German fennel seed, imported French gentian root, imported African foenugreek seed and imported Spanish licorice root.	As certified, ...	6129
5.60	....	18.10	....	5 00	....	Wheat, flaxseed, buckwheat hulls, foenugreek, foxtail, bind weed and salt.	5689
6.50	....	10.62	....	20 00	....	Oat middlings, oat hulls, flaxseed, pepper, Venetian red, sulphur, calcium carbonate and small amount of weed seeds.	6114
4.09	....	5.72	....	25 00	....	Bone meal, small amount of meat scrap, sulphur, pepper and oyster shell.	6113
2.44	....	9.58	....	25 00	....	Linseed oil meal, dried blood, foenugreek, sulphur, calcium carbonate, potassium nitrate, sulphate of iron, charcoal and salt.	5978

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*Per package.

Commonwealth of Pennsylvania.

DEPARTMENT OF AGRICULTURE, DAIRY AND FOOD DIVISION

BULLETIN No. 224

COMMERCIAL TABLE SIRUPS AND MOLASSES

BY

WILLIAM FREAR, PH. D.

N. B. CRITCHFIELD, *Secretary of Agriculture*

JAMES FOUST, *Dairy and Food Commissioner*

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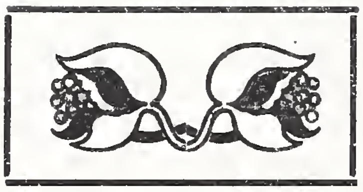
1912

PREFACE

In view of the great and growing consumption of Commercial Table Sirups and Molasses by the people of this country, and especially by children, the question of the wholesomeness of these products is of interest to every citizen. The following report, covering a wide range of sirups and molasses, such as are found in almost every family, is, therefore, made, and authorized to be printed as a Bulletin of this Department for the information of the Public.

N. B. CRITCHFIELD,

Secretary of Agriculture.



LETTER OF TRANSMITTAL

Harrisburg, Pa., March 30, 1912.

Hon. N. B. Critchfield,
Secretary of Agriculture,
Harrisburg, Pa.

Dear Sir: I have the honor to transmit herewith a report by Dr. William Frear, Chemist of this Bureau, upon the commercial table sirups and molasses on the markets of this Commonwealth, with the recommendation that it be published as Bulletin No. 224 of the Department.

Very respectfully,

JAMES FOUST,
Dairy and Food Commissioner.

State College, Pa., March 30, 1912.

Hon. James Foust,
Dairy and Food Commissioner,
Harrisburg, Pa.

Dear Sir: I have the honor to submit herewith my report upon the analyses of commercial table sirups and molasses submitted for investigation by the official sampling agents of the Dairy and Food Bureau.

Very respectfully,

WILLIAM FREAR,

Vice-Director and Chemist, The Pennsylvania State College Agricultural Experiment Station.

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A STUDY OF THE TABLE SIRUPS, MOLASSES, AND GLUCOSES (CORN SIRUPS) ON SALE IN PENNSYLVANIA.

By WILLIAM FREAR

The food articles which are the subject of the present study form a very considerable element in the dietary of the average Pennsylvania family. While sugary liquids and sauces or sweet fruit preparations are common accompaniments of hot or batter-cakes and fritters, and jellies garnish the service with fowl and game in fashionable menus, the sirup jug and preserve jar or fruit-butter dish are part of the ordinary table furnishing for each meal in the every day living of the Pennsylvania family. In addition to butter, it is a very narrowly straitened family that does not also supply with its bread what is aptly termed, in the vernacular of the central counties, a "second spread" of sirup or jam, to be liberally applied to the buttered bread.

The commercial products, which together with numerous domestic preparations, serve these purposes are chiefly maple sirup, refinery sirup, cane molasses—very generally termed "New Orleans molasses," whatever its geographical origin—glucose, or "corn sirup," and much more rarely, cane sirup, and especially, various mixtures of these simple products. Sorghum sirup has practically disappeared, both as a domestic and a commercial article. Beet molasses, owing to its unpleasant flavor and odor, is not fit for table or kitchen use; whereas, cane molasses enters into many articles of cookery which their sugars sweeten, their flavors affect, and their acids serve to leaven, because these acids liberate rapidly the carbonic acid gas from the baking soda used as an associate ingredient.

PRINCIPAL CONSTITUENTS

While each of these articles, except glucose or corn sirup, has its own distinctive flavor, due to various acids and to other flavoring principles not yet isolated and determined, all, with the exception just mentioned, have a sweet flavor due especially to cane-sugar and related sugars. Glucose, or corn sirup, a chemical product from starch, differs markedly in composition from the other articles under consideration, but is composed of substances belonging to the great group of carbohydrates, to which cane sugar and the other sugars related thereto belong. Because these sugars belong in common to all the sirups proper and to molasses, their chemical and food characters will be briefly considered in these introductory paragraphs.

The *carbohydrates* are a great group of substances, including the cellulose, starch, gums and mucilages, dextrins and sugars of the plant world and the glycogen of the animal body. They are composed of the three elements, carbon, hydrogen, and oxygen, the two last named being present in the proportions in which they unite to form water; whence the group name, *carbo-hydrates.* They differ, one from the other, in chemical complexity, and are very largely convertible, one into the other, under the influences in the living plant cells, and, in far more limited degree, in living animal cells. By various laboratory processes, the chemist has been able to reproduce certain of these transformations, especially such as result in a change from complex to simple bodies; but, while recent years have witnessed marvellous advances in his art, he has not yet succeeded in building up from the simplest materials the more complex of these bodies. As food components, the carbohydrates serve as sources of energy and of fat, but not as building materials for the principal tissues of the body.

Of the carbohydrates, certain sugars and dextrins are of immediate interest in this connection. Of the sugars, two classes are represented: The mono-saccharoses or simple sugars, here including dextrose, levulose, and their mixture, invert sugar; and the di-saccharoses, here including cane sugar, (sucrose or saccharose), and maltose or malt-sugar. Of the dextrins, the achro-dextrins are of principal interest in this relation.

Before describing the properties of these several substances, it should be noted that they all belong to what are known as optically active bodies. If a clear crystal of Iceland spar (transparent crystaline carbonate of lime) be placed upon a printed page, the eye of the reader beholds a double image of each letter visible through the spar. This is due to the fact that the spar is doubly refractive and breaks the light rays each into two parts. If crystals of Iceland spar be properly shaped and united by a transparent film of Canadian balsam, one of these two rays is totally reflected while the other passes through the united crystals which, thus combined, are known under the name of *nicol*-prism. If two such prisms be placed at the opposite ends of a metal tube and in like position with respect to the passing rays of light, the portion of light which has passed through the first of the prisms will pass through the second prism with little diminution of intensity; but if the second prism be turned through an angle of 90°, the light from the first prism is entirely cut off, being totally reflected as its twin ray was in passing the first prism. Because of this peculiar behavior of light which has passed through a nicol prism, the light is said to be polarized.

A polariscope is an instrument composed of a metal tube containing two nicol prisms; the first, at the end of the tube through which light enters, is called the *polarizer;* the second, mounted at the farther end of the tube in a ring which can be rotated, is called the *analyzer*. If the analyzer and polarizer of a polariscope be set in such position that the analyzer totally reflects polarized light which has passed through the polarizer, and a sugar solution, contained in a suitable glass tube, be introduced into the polariscope between the two nicol prisms, the polarized light will again pass through the analyzer; and the latter must be rotated to the right or the left through some degrees before the light is again shut off by total reflection. Bodies which so affect light are said to be optically active or to possess rotatory power, and the name *circular polarization* is given to the phenomenon, owing to the fact that the optically active substance appears to give a twist to the light ray. Without further discussion of the theory of such polarization, it is to be noted that those bodies which require the analyzer be turned toward the right in order, with the least rotation, to reach the position of total darkness, are called *dextro-rotatory;* those which require a rotation to the left, *laevo-rotatory.* It is further to be remarked that, if the length of the tube containing the solution be fixed, the degree of rotation required bears a definite relation to the concentration of the solution. For this reason, the polariscope is useful not only in ascertaining the presence of dextro-or laevo-rotatory substances, but also for determining the quantity in which they are present in a solution, or in a substance from which the solution has been prepared; inasmuch as most of the common solvents are not optically active.

The sugars and dextrins have the further property of forming with water solutions of densities definitely related to the proportion of the respective solids in the solutions; hence, the specific gravity of the solution, that is, its weight, as compared with that of an equal volume of water at the same temperature, indicates very closely the quantity of these solids in solution. Furthermore, the refractive index of sugar or dextrin solutions, that is, the power of these solutions to bend a ray of light entering or passing from them into the air, also bears a definite relation, at a fixed temperature, to the percentage strength of the solution. For these reasons, both the specific gravity and the refractive index of a sirup are physical properties useful for the purpose of the analyst.

Dextrose, d-glucose, grape sugar, starch sugar ($C_6H_{12}O_6$) occurs, but usually in association with other carbohydrates, especially levulose and cane sugar, dissolved in the juices of numerous plants, especially in those of the sweet fruits. Honey contains it in large quantity, and often in the form of white crystals. Dextrose is obtained also when cane sugar is acted upon by certain ferments and acids; and, in like manner, from malt sugar; in the former case, associated with levulose; and it is the end-product obtained when starch is acted upon by dilute acids, mineral and oxalic. Dextrose is sweet, but not more than three-fifths as sweet as cane sugar. While it can be crystallized, the process is much more difficult than in the case of cane sugar. The product is now, however, manufactured extensively. Dextrose shares with certain other substances the property of multirotation; that is, it does not exhibit the same optical activity immediately after it is dissolved, as it does after the solution has stood for some time. After twenty-four hours standing, its dextro-rotatory power is constant. When heated at a temperature of more than 200° C. (392° F) it turns to *caramel* or sugar color, a brownish black substance of bitter flavor and high coloring power. When a solution of dextrose is heated with Fehling's solution (an alkaline copper solution), it reduces the copper to the form of an insoluble red suboxid, whose quantity can be determined and bears a definite relation to that of the dextrose, providing proper precautions are used. This sugar is highly fermentable and can be directly acted upon in solution by yeasts and molds to form carbonic acid and alcohol. As a food for man, it has high nutrient value, being capable of digestion without previous chemical change. One gram of dextrose gives up when burned 3742.6 calories of energy; that is, heat enough to warm 3742.6 times its weight of water from a temperature of 4° C up to 5° C. It is changed in the animal body, uniting with other materials to form a variety of substances, of which *glycogen,* the sweet principle of the liver, is an important member. In the course of certain diseases, it fails either to be thus combined or to be fully oxidized to carbonic acid and water as the tissues waste, and therefore is excreted in the urine, producing the symptom, *diabetes mellitus.*

Levulose, d-fructose, fruit-sugar, ($C_6H_{12}O_6$) occurs with dextrose in plant juices and in honey. It too is formed when cane sugar is acted upon by weak acids and by certain ferments. It is also made by the action of acids upon inulin, the carbohydrate characteristic of the artichoke. Levulose is not a very stable body and is therefore difficult to prepare in a pure state.

It crystallizes less readily than dextrose. It is sold, in a nearly pure state, under the name of "diabetin." Levulose dissolves in water to form a solution sweeter than that of cane sugar. It decomposes readily on heating, even at a temperature as low as that of boiling water. For this reason, it is impossible to determine exactly, by evaporation under ordinary conditions, the quantity of solids dissolved in a liquid, if levulose be one of the components. It differs in optical activity from dextrose in that it has a left hand rotation, differing also in degree from that of dextrose, and also in the further particular, that its optical activity decreases rapidly with an increase in the temperature of the solution under observation, whereas the optical activity of dextrose is little affected by temperature variations. Levulose like dextrose, exhibits multirotation. It too reduces Fehling's solution, and somewhat more vigorously than dextrose. Like the latter, it is capable of direct fermentation by some yeasts to form alcohol and carbonic acid, but its fermentation is slower than that of dextrose, and beer yeast is unable to set up alcoholic fermentation in a levulose solution. Levulose, also, is capable of direct absorption by the animal body without previous digestive change. It is undoubtedly assimilated in the same general manner as dextrose, but rarely appears in the urine. Its heat of combustion is about the same as that of dextrose.

Invert Sugar: When cane sugar solutions are carefully heated with oxalic acid, the sugar splits, combining with water in the process, into dextrose and levulose, in equal parts. Mineral acids also effect a like change, as well as certain unorganized ferments, which are therefore called *invertases*. A water solution containing about 25% of cane sugar, when mixed with one-twentieth of its volume of strong hydrochloric acid, and heated carefully so that in fifteen minutes its temperature is raised to 68° C (about 157° F.), is completely inverted. A like mixture inverts completely on standing for ten hours at 20°C (68°F.), and, in manufacturing practice, much smaller quantities of acid are used with complete effect, though a longer period is required for the change. The invert sugar solution thus produced is very sweet, and has often been used as an adulterant for honey. This sugar mixture is formed in considerable amounts whenever cane sugar solutions are heated in the presence of any acid, and, in small amount, even on prolonged heating of a pure sugar solution. It is also formed during most fermentations of cane-sugar, though, owing to the difference in the susceptibility of dextrose and levulose to alcoholic fermentation, the equality of these two sugars in the product from the splitting up of the cane sugar, is probably not long maintained; and the greater instability of levulose when heated, tends to produce a like result. In its behavior toward Fehling's solution, invert sugar resembles its two components. Owing to the unlike character of the optical activity of dextrose and levulose with respect to temperature variation, invert sugar, though strongly laevorotatory at ordinary temperatures, shows no activity whatever when heated with extreme care up to 87° C., as the opposite tendencies of the component sugars exactly neutralize one another at this temperature; heated to a higher degree, the rotation becomes right-hand and, if the heat be high enough or sufficiently prolonged to cause some decomposition of levulose, remains right-hand even though the solution be cooled down to 87° C. This optical behavior of invert sugar is highly valuable for its quantitative determination.

Cane sugar, sucrose, saccharose, ($C_{12}H_{22}O_{11}$) occurs, usually with dextrose and levulose, in a great variety of plants. Its principal sources for manufacturing purposes are the sugar cane, the sugar beet, and the maple. Although many attempts to prepare it artificially have been made, they have thus far failed. It occurs in commerce in beautiful white, rhombic crystals. Prepared in large crystals slowly formed in a concentrated solution of purified or refined sugar, it is known as "rock candy," and the residual solution as "rock candy syrup." When heated to 160°CC. (320° F.) it melts, forming upon cooling a yellow solid known as "barley sugar;" heated at slightly higher temperature it splits up into dextrose and levulosan, a substance formed when levulose is heated so as to drive off water; and at still higher heats, progressively yields glucosan or dextrosan and caramelan. When its solution is boiled with dilute acids, it is inverted, as previously stated, yielding equal parts of dextrose and levoluse. If a water solution of this sugar is boiled for a long time, it becomes acid and less viscid, owing to the formation of invert sugar. The action of sucrase or invertase, a soluble ferment extractible from yeast, results also in inversion. Cane sugar is not directly fermented by yeast to form alcohol and carbonic acid; not until it has been inverted, can the alcoholic fermentation proceed. Also, this sugar does not directly reduce Fehling's solution, although on long boiling some inversion occurs, whereupon a slight formation of the copper sub-oxid follows. Cane sugar is strongly dextrorotatory, but, upon inversion, its solutions yields laevo-rotatory liquids, that is, solutions of invert sugar. This optical behavior, before and after inversion, is valuable in determining the quantity of cane sugar in solution with the other sugars, the successive polariscopic readings being made at the same temperature and the cane sugar computed by the following formula:

$$\text{Cane sugar } (\%) = \frac{(a - a^1)\ 100}{142.66 - \frac{1}{2}\ T.}$$

where a and a^1 are the polariscope readings before and after inversion and T is the temperature at which these readings were made.

Cane sugar, like the monosaccharoses, has the power of acting in some relations like an acid. It acts rapidly and corrosively upon iron and steel, hence the use of copper and tin-plate vessels for confectioners' and preservers' purposes; also upon lead, taking this metal into solution, wherefore containers and faucets for holding and delivering sugary liquids, should not have leaden or lead-alloy parts in contact with the liquids; nor should lead-containing foil be used as a wrapper for confectionery, unless protected from contact therewith.

Cane sugar is regarded as, to some extent, directly digestible. Nevertheless, it is partially inverted in the stomach by the acid secretion and also very promptly upon entry into the small intestine. If injected into the bowel below the pancreatic duct, it leaves the body unchanged. From recent physiological experiments with man and domestic animals, it appears to have especial value as a prompt restorer of muscular vigor, and has of late been largely used by athletes and by soldiers on the march, and also fed in molasses to dray horses.

Malt sugar, maltrose. Malt contains two closely related disaccharose sugars, maltose ($C_{12}H_{22}O_{11}+H_2O$) and isomaltose ($C_{12}H_{22}O_{11}$). These sugars have many properties in common; for example, both are sweet, readily soluble in water, capable of reducing Fehling's solution but in different proportion to a unit weight of the respective sugars, and highly dextro-rotatory though in somewhat different degree. Maltose has, when just dissolved, a much lower optical activity than some hours after the solution has been made. It can be crystallized in fine needles, but isomaltose has not thus far been crystallized. The latter is far less readily fermentable than maltose, and is, according to Baer, not all fermented by "bottom" or ordinary beer yeast. Maltose itself does not undergo alcoholic fermentation by the yeast species known as *Saccharomyces apiculatus* and *S. Maxianus.* These differences in behavior are useful in separating these sugars, as is the great difference in certain of their compounds known as *osazones*, which need not be described for the purposes of this publication.

Both these sugars are produced in the progressive changes which starch undergoes in germinating barley under the influence of its soluble ferment, *diastase.* A like series of changes is produced by dilute mineral acids, such as sulphuric and hydrochloric, and also by oxalic acid at boiling heat. The starch grains burst, and their contents form what is known as "soluble starch," because of its solubility in water. Like raw starch, it is colored an intense blue by iodin. In turn it is changed to erythro-dextrin, giving a wine-red color with iodin, and progressively into a series of dextrins called achro-dextrins, because they give no characteristic color with iodin. According to Lintner and Dull, each step in this progressive dextrinization is accompanied by a splitting off of isomaltose, which is also yielded upon the breaking down of the last achro-dextrin; and the isomaltose, in turn, is then converted into maltose. Here the malting practically stops; whereas, on rather prolonged treatment with acid, maltose is split up to form with water the simple sugar, dextrose.

The digestion of starch exhibits a progressive series of decomposition products much the same as that shown in the germination and acid hydrolysis processes. The saliva, by action of the pytalin or salivary amylase it contains, carries the processes through to the maltose stage, providing the conditions allows it to act long enough upon the starch. The action is arrested by weak acid, such as that of the gastric juice; but, owing to the time required in the stomach for the complete mixing of the gastric juice with the food received from the mouth, salivary digestion probably continues for sometime after the arrival of the food in the cardiac, or heart end of the stomach. The saliva also contains some maltase or glucase, by which a small part of the maltose is transformed into dextrose. The salivary action of raw starch is very slow, but in the case of cooked starch the changes are set up instantly upon contact with saliva. When the partially digested food is passed on from the stomach to the small intestine, it is mixed with several digestive secretions which there enter the alimentary canal. One of these, the pancreatic juice, secreted by the pancreas, or sweet bread, contains a number of digestive ferments, each having a specific function; of these ferments, we are particularly interested in sucrase, which inverts cane sugar, an amylase more vigorous than the ptyalin of the saliva in converting starch to dextrin and later to maltase, and finally a maltase or glucase by which maltose is in part hydrolyzed to dextrose. Maltose, $C_{12}H_{22}O_{11}$, H_2O, has a heat of combustion of 3721.8; isomaltose (?), of 3949.3 calories.

Dextrin, achro-dextrin: The occurrence and manufacture of these bodies may have already been sufficiently described, though it may be here noted that starch exposed to roasting temperature in converted to dextrin, which forms the glossy coat of bread crust. It remains to be noted that they are white, non-crystalline bodies of rather gummy character, which dissolve in water forming very viscid solutions, but are thrown out of solution when enough alcohol is added to make the liquid moderately alcoholic (about 30%), whereas the sugars are soluble in 80% alcohol, though not in absolute alcohol. The dextrins are all highly dextro-rotatory, though they differ from one another in their degree of optical activity and in their alcohol solubility. They are devoid of any marked sweetness of flavor; have little, if any, power of reducing copper solutions; and are not directly fermentable by yeast. As already indicated, they require a more extensive change by digestive processes to fit than for assimilation than do the sugars.

MAPLE SIRUPS

Maple sirups are made, directly or indirectly, from the sweet sap of various species of the maple. It might with fitness be called the American sirup, since it was crudely made by the Indians probably long before the first European settler came to the Western continent.[1] Today its manufacture is carried on in many States of the Union and also in Canada. Vermont, New York, Ohio, Michigan, Pennsylvania and New Hampshire are its principal American sources. According to Hills[2], no maple sugar is made south of 35° latitude, or west of 95° longitude.

Owing to the fact that this sirup is produced in Pennsylvania its production deserves somewhat extended consideration.

THE SUGAR OF THE MAPLE AND ITS ORIGIN

The sugar of maple sap is saccharose, commonly called "cane sugar," the same, in other words, as the natural sweet substance of the sugar-beet, and the principal sugar in the juice of the sugar-cane.

Though the tree is not in a condition of active growth at the time when the sap flow begins which is diverted to the sugar maker's use, and the substances dissolved in the sap are, except as they may be taken up directly from the soil, derived from reserve food supplies stored in the wood, during the preceding growing season, to meet the tree's needs early in the spring, the sugar itself is not found as such in the wood of trunk, root, or branch, nor in the bark, except it may be in traces.

Investigators had, long ago, observed the occurrence of starch in the winter wood and especially the root wood of the maple, and its disappearance upon the spring-time development of the buds and leaves, Storer[3], in various studies of the source of the maple sugar, described the occurrence and arrangement of the starch in various parts of the woody tissues. With these findings, Spaulding and White, investigating the matter more widely by michrochemical methods under the direction of Jones[4], were in close agreement. They found that the starch (and associated sugars) occurs chiefly in the cells and fibers of the sap wood; that it is most abundant in the medullary rays; and that, in general, it appears to be deposited in the outer cells first and then progressively inward.

As to the quantity of starch present in the wood, few determinations have been made. Storer[5], by treatment with malt extract, obtained from various tissues of a sugar maple felled in May, reducing materials equivalent to the following percentages of starch in the water-free wood: Inner wood, 1.94%; outer wood, 2.43%; bark, 5.97%. No attempt was made in these determinations to separate the sugars before proceeding to the estimation of the starch. Any sugars present are therefore represented in these figures by their equivalent of starch. Elsewhere[3], this author reports that he obtained from the wood of a sugar maple root by aid of malt extract, the equivalent of 5 to 7 per cent. of starch; in this case, the wood yielded to boiling water matters capable, without previous treatment with malt extract, of reducing Fehling's solution, and therefore assumed to be dextrose or invert sugar. The quantity was equivalent to 4.12% of dextrose. Storer[6] judged the quantity of starch to be insufficient, however, to account for the amounts of sugar developed and the physiological work performed, observed that mannan also is present in the winter wood, but not in that of trees felled after the sap flow, and suggests that this constitutent also might serve as a source of cane sugar, which has been found in the seeds of coniferous trees, whose seeds contain mannan as a prominent constituent.

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[1] Small figures in the body of the page refer to reference lists.

Combining the data given by Jones and Storer, it would appear, however, that the starch found by Storer is probably equivalent at least to the cane sugar formed in the tree during the season of sap flow, as indicated by the quantity of sap in the tree and the richness in sugar of that portion of the sap which flowed from the tap.

SAP FLOW

The Rock Maple or Sugar Maple (*Acer saccharinum, Wang)* is the principal source of maple sugar and sirup, but sugar-containing sap is also obtained from the Black Maple or Black Sugar Maple (*A. saccharinum,* Var. *nigrum,* Torrey and Gray; *A. nigrum,* Michx.), the White, Silver, Soft, or River Maple (*A. dasycarpum,* Ehrh.) the Red, Swamp, or Water Maple (*A. rubrum,* Linn.), the Oregon or Cabinet Maple (*A. macrophyllum,)* the Vine Maple (*A. circinatum,* Pursh.), the Striped Maple (*A. Pennsylvanicum,* Linn.), the Norway Maple (*A. platanoides,* Linn.), and also from the Ash-leaved Maple or Box-Elder (*Negundo aceroides,* Moench.) a species closely related to the maple; and most of these species are used as sources of commercial sirup and sugar.

All these species possess the property of copious bleeding from wounds during the later Fall and early Spring months, and sometimes even on sunny days in mid-winter. The sap flows most freely from the young wood, relatively little coming from the heart wood. The flow is most abundant near the base of the trunk. The flow occurs chiefly in day-time and is most abundant when the ground is covered with snow, the earth is moist, the days warm and the nights cold. Trees with a relatively large leafage and sunny exposure during the preceding summer, yield the most sugar.

The conditions and causes of this very special kind of sap flow have been extensively studied by Clark[7], Schroeder[8], Wood[9], and the writer[10], but the most searching and extensive investigations upon this subject are those recently made by Jones, Edson and Morse[2], of the Vermont Agricultural Experiment Station. This phase of the subject can not be discussed in this connection. It appears, however, that the flow is probably the result of an intermittent internal pressure due to the expulsion of the sap from the interior of the living cells by the action of their protoplasm or jelly-like contents, and that this cell activity is a normal process and is more or less stimulated by the alternating atmospheric temperatures peculiar to the seasons of flow.

QUANTITY AND COMPOSITION OF MAPLE SAP

The quantity of sap yielded by a single tree varies, of course, with its size and surroundings. The writer obtained from thirteen fair-sized trees in April, 1885, an average total flow, for the season, of 62.3 pounds, or about 6½ gallons per tree, though individual trees varied from about 9 pounds up to 171.7 pounds. In more favorable seasons, the flow would probably have greatly exceeded these quantities.

The white and red maples gave fully as much sap, in proportion to their size, as the rock maples.

Jones and his associates reached the same conclusion, but question the endurance of so great yields.

The average sugar richness of the sap of various trees is quite different, ranging, in the writer's experience, from 2.33 to 5.01% in a season of moderate richness. Jones reports a range of 1.33 to 7.149% for single days and single trees in 1900. Sap from the same tree varies in sugar richness during the season, but with no apparent regularity; and even at different hours of the same day, or at the same hour on different sides of the tree, shows differences in composition. Taps at different elevations on the same tree, not only yield much less sap from the upper than from the lower taps, but also a much richer sap, the flow from the upper taps often having an almost sirupy consistence.

The total sugar obtainable in a single season from a tree of size large enough for use, ranges from ⅓ to as high as 40 pounds; but the average is from two to five pounds, according to the season. The quantity of sap required for each pound of sugar made, is about 16 quarts, though for some seasons and some trees, the volume of sap needful runs as low as 5 quarts.

The juice from most sugar-containing plants usually contains, associated with the cane-sugar, relatively large amounts of dextrose and levulose. The juice of the sugar-beet is free from these sugars, but, as appears in another part of this bulletin, the juice of the sugar-cane contains them in considerable quantities, while in the juice of the sorghum they are relatively so abundant as to make difficult the manufacture of cane-sugar from this source. In the maple sap, these reducing sugars are often absent, in the case of early run saps; but, as the time of bud development arrives, these sugars appear in the sap in small amounts. The writer found in eight saps taken near the last of April an average of 0.256% of reducing sugars, though excluding three "buddy" saps in which the quantities were exceptionally high, the average was reduced to .057%.

Starch was sought by the writer in a large number of saps without its discovery in any instance.

The saps do, however, all contain nitrogenous, acid, and mineral constituents. The writer found albuminoids (calculated from the total combined nitrogen present) in amounts ranging from .0069 to .0469%, the maximum quantity appearing in the late runs.

All the fresh saps have a fairly acid reaction, ranging in fresh juices, from .0005 to .005%, stated as malic acid. The sap of the maple is characterized by containing in quantities differing with the soil upon which the tree stands, an acid malate of lime. This, when the sap is concentrated, becomes insoluble and is deposited in grayish crystals to which the sugar makers have given the name "sand" and "niter." Some orchards yield sap containing such abundance of this acid compound, that it encrusts the evaporating pans and interferes seriously with the evaporating process, and later, as the sirup cools, separates forming a dirty looking gray, gritty deposit at the bottom of the container.* The peculiar flavor of maple sirup and sugar is not readily perceptible in the sap, concentration being necessary before the flavor becomes distinct. The nature of the distinctive flavoring principle has not been satisfactorily determined. It can, however, be largely separated from the sirup by agitation with ether, in which the flavoring substance or substances are more soluble than in water.

The character of the mineral matters will be discussed when the composition of the sirups is considered.

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*Warren [13] states that, with care, 16-25 lbs. of this crude malate can be obtained in a single season. This composition of the malate is given by him as:

	Per cent.
Ferric oxid,	.39
Calcium oxid,	17.16
Magnesium oxid,	.03
Phosphoric acid,	.05
Silica,	7.74
Malic acid,	51.48
Carbon dioxid,	.66
Invert sugar,	2.31
Cane sugar,	3.46
Ether-soluble matter,	.37
Extraneous organic matter,	2.35
Moisture,	2.60
Undetermined,	11.40
	100.00

MANUFACTURE OF MAPLE SIRUP

In early days, the making of maple sirup and sugar was carried on in a very crude way. The trees were tapped by cutting with an ax an obliquely upward gash, into which a chip was fitted to serve as a spout. The sap was collected in roughly hewn, wooden troughs and carried in pails to the nearby iron kettle set on or swung from a tripod. The boiling process was continued, with little or no purification of the juice, until the contents of the kettle were brought to the desired consistence. The rough method of tapping the trees was, however, very destructive to their vitality and the flow and color of the sirup were not superior.

The processes of today, though simpler than is the case with the manufacture of any other true sirup, show a very distinct advance over the earlier methods just described. The trees are tapped with a three-eighth inch bit and deeply enough to penetrate the sap-wood. A galvanized metal spout is driven into the tap-hole. From the spout is suspended a heavily tinned pail with a cover to exclude rain water, and prevent the access of birds, squirrels and other animals. The sap is gathered daily, gathering tanks of tinned metal placed upon wagons or sleds being used for the purpose, and from these gathering tanks the sap is transferred to the metal storage tanks of the sugar house.

In the present day practice, it is the aim to avoid storage of the sap, because of its liability to bacterial fermentation. In the latter part of the season, as the weather grows warmer, sap often assumes a green or greenish brown color, or becomes milky, or exhibits long strings of water-white glairy substance insoluble in alcohol, all of which yield dark-colored, off-flavored sirup and sugar. Edson[14] finds all these defects to be due to various bacteria, and recommends repeated cleansing of sap pails, the use of covered pails, and the avoidance of storage. In Ohio, where the season is rather long, the tap-holes are often bored out with a slightly larger bit, late in the season, to remove bacterial growths that have accumulated in the tap-hole.

It happens, not infrequently, that, during cold nights, the afternoon flow of sap freezes in the pails. The freezing is rarely complete; the result being that most of the sugar is concentrated in the unfrozen portion of the sap. Many sugar makers reject the ice as worthless, but Jones[15] has shown that, on the average of five observations, the ice contained over one-fourth of the original sugar, an amount probably sufficient to repay the cost of evaporation.

As already stated, the apparatus and process of evaporation have been markedly improved in recent years. From ordinary kettles, an advance was made to shallow sheet-iron pans resting on a brick arch, provided with flue and draft regulators. Today, long iron furnaces with improved draft regulation are used, upon which are mounted, with a gentle inclination from rear to front, tinned pans of about six inches depth, provided with partitions set at right angles to the long axis of the pan, reaching but part way across the bottom, and alternately joined to the respective long sides of the pan, so that the sap, which is automatically delivered at the rear of the evaporator, may flow slowly from side to side as it moves forward. The stream is kept at a depth of about 1½ inches at the upper and 1 inch at the lower end of the pan.

As the sap is heated, the albumen is coagulated and rises with other impurities, so that they may be skimmed off. Milk is sometimes added in small quantity to facilitate the purification, but is undesirable, because it introduces foreign matters that unfavorably affect the excellence of flavor of the finished product.

The boiling is continued until the sirup has reached a concentration such that the boiling sirup has a temperature of 219° Fahr., corresponding to 11 pounds weight per gallon of sirup.[16]

If "niter" appears in the sirup, it may be removed by filtering the hot sirup through a flannel filter. If the lower sections of the pan become coated with the niter, it may be removed readily by reversing the position of the ends of the pans, so that the coated sections are exposed to fresh sap, by whose action the niter is redissolved.[17]

Concerning the effects of filtration, Jones notes that filtration through sand does not lessen the flavor intensity of the sirup, but that by filtering it through charcoal, not only is most of the color removed, but, as well, most of the distinctive flavor to which the sirup owes its high value as compared with simple sirups prepared from ordinary refined cane or beet sugar.

In many instances, the sirup, instead of being held as such, is further concentrated until it "sugars off." It is not germane to the subject of this bulletin to describe this process in detail. It should, however, be noted, since much commercial maple sirup is made by "melting," that is, dissolving maple sugar in water, that in the making of the sugar no molasses is separated and no chemical addition is made. In other words, all the constituents of the sirup, other than water, are retained unchanged, except by heat; so that the product is what is known technically in sugar manufacture as a "concrete." Sirups intended for sale as such, rather than for subsequent sugaring off, are usually clarified more carefully than where sugar is the end product.

GENERAL QUALITIES OF MAPLE SIRUP

As the process of manufacture above described, has doubtless made clear, maple sirup is maple sap, less water removed by evaporation and albuminoids with minute quantities of associated materials removed by skimming, and in some cases, less malate of lime removed by sedimentation or filtration; plus such conversion products as the original materials may yield under the influence of heat during evaporation. Or, if the sirup be made from maple sugar (concrete), it is simply maple sugar plus water.

Pure sirups may, before they reach the consumer, deteriorate, however, because of the attack of yeasts or molds, which convert the cane sugar to invert sugar or even completely destroy part of the sugars, and impart a musty, undesirable quality to the flavor. Sirups of too low body or concentration are especially subject to such attacks. Wherever possible, the sirup should be delivered hot into the containers, previously sterilized by heat, in which the sirup is to be delivered to the consumer.

As previously stated, maple sirups owe their value chiefly to the distinctive flavor, in adition to that of mere sweetness, which they possess. These sirups exhibit, however, quite a range of quality as respects this distinctive flavor, the corresponding odor, and color.

Jones[18] thus describes these three qualities:

"*Aroma.*—The odor of maple products is at once pleasing and characteristic. That it is due to some partially voltile principle, the odor of boiling sap or syrup makes plain. This aroma is at its best when the goods are fresh. It is apt to be 'bound up' in old and dry samples as to be apparently lacking."

"*Flavor.*—The flavor or taste of maple goods may serve in a measure to indicate their purity. Inasmuch as many pure maple syrups, particularly those produced in certain sections of the country, have what might be termed a 'molasses taste,' it is best not to form hasty opinions from this sense alone, especially if the origin, age, and conditions of manufacture are not known. The flavor, taken into consideration with color, is a good criterion as to *quality* of maple products."

"The general characteristic of maple syrups from different sections of the sugar producing areas that have come under the writer's notice may be thus briefly described. Remarks refer to average quality goods:

"Pennsylvania: Sweet and flat (often like molasses); maple flavor.
"Ohio: Mild, delicate almost to flatness; maple flavor.
"Vermont: Mild, delicate; good maple flavor.
"New York: Strong; maple flavor.
"Canada: Good maple flavor. Bulk of product dark in color, with strong flavor, occasioned by demand.

"As far as marketable differences go, there is but small choice between Vermont, New York and Canadian goods of equal grade."

"*Color.*—The color of maple syrup and sugar is no indication of purity. Pure goods may be almost snow white, or they may be nearly jet black or any intermediate shade of brown. The color of pure goods is largely dependent on the methods used in handling and boiling the sap. The careless operator, even with the best utensils, will produce a poor grade, highly colored syrup or sugar. On the other hand, his cleanly and careful neighbor will make a first grade material."

GENERAL COMPOSITION OF MAPLE SIRUP AND MAPLE SUGAR

From what has been earlier stated, it is clear that the degrees of concentration and purification of these products vary with the aims and skill of the manufacturer, and, in a measure, also with the character of the sap which serves as his raw material. A general idea of the composition of these products may be obtained from careful analyses of authentic sirups collected by the writer in Vermont[19] and of authentic sirups and sugars collected by Hortvet[20] from New Hampshire, Vermont, Conecticut, New York, Pennsylvania, Wisconsin, and Minnesota, although no true average for the manufacture as a whole can be secured from the data afforded by the thirty-two sirups and nineteen sugars represented in these averages. The latter are as follows:

	Maple syrups	Maple sugars.
	%	%
Moisture,	33.87	8.85
Cane sugar,	59.88	84.77
Invert sugar,	2.75	2.23
Albuminoids,	.196	.495
Ash,	.64	.91
Undetermined,	2.664	2.745
	100.000	100.000

It is of prime importance to the consumer that he obtain the genuine maple flavor in as concentrated form as practicable; or, at least, that the product he buys shall be as well standardized as conditions allow in respect to this principal quality of the maple products. The normal variations with the quality of the raw materials are sufficiently wide to meet the divergent tastes of consumers and the corresponding demands for delicate, or for relatively rank flavors, without a further modification of flavor intensity by a graduation of the concentration of the sirup.

The Secretary of Agriculture[21] of the United States has proclaimed, under authority of Congress, the following standards for these products:

> "*Maple Sirup* is sirup made by the evaporation of maple sap or by the solution of maple concrete, and contains not more than thirty-two (32) per cent. of water, and not less than forty-five hundredths (0.45) per cent. of maple sirup ash."
>
> "*Maple Sugar* is the solid product resulting from the evaporation of maple sap, and contains, in the water-free substance, not less than sixty-five one-hundredths (0.65) per cent. of maple sugar ash."

Pennsylvania has no statutory, or regulative standard for maple products, but many of the States have, either by law or by duly authorized regulations, adopted the standards proclaimed by the Secretary of Agriculture.*

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*The following standards for maple products were promulgated, March 22, 1911, by the Dominion of Canada,[22] by order in Council, under Sec. 26, Adulteration Act.

"Maple syrup is syrup, made by evaporation of maple sap, or by the solution of maple concrete in water; and contains not more than thirty-five (35) per cent. of water. The total ash, reckoned as a percentage on the dry matter of the syrup, shall not be less than 0.5 (five-tenths of one per cent.) The malic acid determined in prescribed manner, shall not be less than 0.4 (four-tenths of one per cent), reckoned as a percentage on dry solids. The lead subacetate number, determined as prescribed, shall not be less than 2.2 (two and two-tenths)."

For reasons later stated in the body of this bulletin, the Canadian officials propose to reduce the malic acid to 0.3 per cent. and the lead acetate to 1.7, and also to fix a minimum limit for insoluble ash at 0.12 per cent. of the dry solids.

The National standard for maple sirup corresponds to a density of 1.3384. The general practice of maple sirup makers is to accept 11 pounds to the gallon, corresponding to a density of 1.325, as the desirable degree of concentration. Thus, speaking of the practice in Vermont, Cooke and Hills[16], writing in 1891, say:

"Most sugar makers boil down syrup until it weighs 11 pounds to the gallon and then let it cool. The particular point in making syrup is to get it as thick as possible without having it granulate on standing. The ordinary rule of the maker is to make syrup that shall weigh 11 pounds to the gallon, and we have found by experiment that this custom is exactly right and that the temperature corresponding to this weight is 219°. That is, if the syrup is taken off from the fire as soon as it shows a temperature of 219° it will weigh exactly 11 pounds to the gallon and will not grain on standing. That is. however, the extreme limit; if the temperature is allowed to get a single degree higher, the syrup will granulate. In practice, not much of the syrup that is on the market is quite up to this point, most of it being taken off just before it reaches 219°, and large quantities were on the market last spring (1891) which boiled at 216° or even less."

Hubbard[17] too, in writing in 1906, said, "When the sirup reaches a temperature of 219° F., or a weight of 11 pounds to the gallon, a deposit of malate of lime or 'niter,' will be observed. This temperature and weight are proper for good sirup."

In reference to the indicative temperature above mentioned, it should be remarked that the boiling points of liquids decrease with the altitude above sea-level of the place of observation. Sirup makers living at altitudes over 500 feet above sea-level should determine for their own locality the proper final boiling point corresponding to the standard density for maple sirup.

Another point relative to the concentration of the sirup deserves notice, viz: That, the denser the sirup, the less its tendency to deterioration by ferments,—another reason on the consumer's part for desiring a concentrated, rather than a watery sirup.

The sugars shown in the average analyses stated on an earlier page, exhibit more invert sugar than the traces present in fresh sap would lead us to expect. It is known that on long boiling, the cane-sugar of maple sap is inverted in considerable quantities; but since the concentration in a modern evaporator takes but a short time, sirups of standard density have been made from clean, fresh sap so as to show little more than 0.5% of invert sugar in the finished product. Slow boiling in sugaring off also increases the proportion of inversion, which would be manifest in sirups made from the resulting sugars. High invert sugar is chiefly attributable to fermentation of the sirup, or, in less degree, to souring of the sap by careless gathering and storage.

It is worthy of note respecting the sugars, that Storer[26] was unable to isolate mannose from maple sugar, although mannan was found in maple trees.

The analyses show, in addition to moisture and sugars, considerable quantities of other materials, including ash and "albuminoids." Concerning the ash, full discussion will be given in a later paragraph. The quantity of albuminoids is determined by calculation from the total nitrogen yielded by the sirup or sugar. As a matter of fact, it is not probable that the nitrogen is chiefly present in albuminous compounds, since true albumen would be coagulated like the white of an egg by the heat of the evaporation and largely removed in the skimming and filtration. The nitrogen is probably present more largely in less complex, soluble compounds that are not coagulated by heat.

Among the undetermined matters, are acids, including malic acid, and the brown or reddish brown materials of the sirup and sugar.

ADULTERATION OF MAPLE SIRUP

Owing to the relatively high price of maple as compared with ordinary cane and beet sugars and with glucose, the practice of mixing maple sirup with sugar solutions prepared either from ordinary refined sugar or from crude brown sugar, has been very general, as well as that of mixing with glucose. Admixtures of the latter kind were readily detected not only by study of the optical behavior of the mixture, but also by the peculiarly thick or viscous consistence of the mixture. A representative of certain manufacturers of such adulterated products stated to the writer several years before the passage of the National Food and Drugs Act, that fully 95% of the so-called "maple sirups" on the market were either thus compounded or wholly spurious, and urged the great excess of demand over supply of maple products as a satisfactory reason for tolerance of this wholesale fraud—for all these products were sold under the name of the genuine article.

Among the imitations upon the market have been found ordinary sugar sirups flavored with extracts from hickory or maple wood or bark, or with distillates prepared therefrom. Recently a flavoring preparation, known as "Mapleine," has been put upon the market a very little of which is said to impart a maple flavor to a relatively large quantity of sugar sirup. Another imitation quite satisfactory to many palates is made by boiling sugar sirup with corn cobs, from which a pleasant flavor is extracted.

There is no good reason why such imitations should not be made for home consumption, if they are agreeable to the consumer's taste, but there is no sound excuse for vending them under deceptive names.

DETECTION OF ADULTERATION OF MAPLE SIRUPS.

Owing to the similarity of the principal constituents of maple sirup and those of the common compounds and imitations thereof, a study of the sugars present offers no clue to the fact of adulteration, except where glucose mixtures are concerned; and, in the absence of conclusive means of distinguishing and estimating the characteristic maple flavor, recourse must be had to other differences, not in themselves directly affecting the values of the respective commodities, as proofs of the fact and character of the adulteration.

Maple Sirup Ash: The quantity of the maple sirup ash has long been recognized as a means of distinguishing the genuine sirup from the sirups made from refined cane sugar. Jones[27] and Hortvet[28] first studied extensively the properties and detailed compositions of the maple sirup and sugar ash as means of differentiating maple sirup from the adulterated and spurious sirups on the market.

Bryan[29] has compiled the results of these investigations together with those of about 60 authentic samples examined in the Bureau of Chemistry as follows:

CALCULATED ON ORIGINAL SUBSTANCE

	Maple Sugar			Maple Syrup		
	Minimum	Maximum	Average	Minimum	Maximum	Average
Water, (Per cent.),	3.05	11.00	-----------	Not	more than	32.00
Ash:						
Total, (Per cent.),	0.64	1.32	0.91	0.46	1.01	0.60
Soluble, (Per cent.),	0.33	0.67	0.46	0.21	0.63	0.38
Insoluble, (Per cent.),	0.20	0.87	0.46	0.14	0.56	0.23
Alkalinity of ash:*						
Soluble,	0.40	0.95	0.63	0.26	0.68	0.50
Insoluble,	0.55	1.72	0.94	0.31	0.94	0.54
Ratio of insoluble to soluble ash,	0.5	2.2	1.00	0.6	3.2	1.7

*CC.N/10 acid required to neutralize ash from 1 gram of syrup or sugar.

Since the foregoing summary was written, the Chief Analyst[22] of the Inland Revenue Department of Canada, has published the result of analyses of 115 samples of maple syrup submitted by manufacturers with a declaration of purity and description of the methods of manufacture, many of which include the latest improvements in clarification and filtration. These gave a total ash: maximum 1.38; minimum, 0.69; average, 0.89 per cent.: and of insoluble ash: maximum, 1.01; minimum, 0.23; average, 0.37 per cent. Of the total ash, only one sample showed less than 0.70%; of the insoluble ash, only two samples had less than 0.19%.

In the absence of moisture determinations in many of the samples included in the foregoing summary, it was impossible to express the data on the basis of the dry matter of the sirups, the only basis affording means for strict comparison. The analyses made by Jones in 1905, representing 48 authentic sirups and 43 authentic sugars, have, however, been computed on the dry basis, as follows:

CALCULATED TO DRY SUBSTANCE.

	Maple Sugar			Maple Syrup		
	Minimum	Maximum	Average	Minimum	Maximum	Average
Ash:						
Total, (Per cent.),	0.71	1.47	1.01	0.77	1.32	0.92
Soluble, (Per cent.),	0.40	0.70	0.53	0.45	0.72	0.58
Insoluble, (Per cent.),	0.22	0.97	0.48	0.25	0.78	0.34
Alkalinity of ash:						
Soluble,	0.44	0.89	0.68	0.46	1.02	0.79
Insoluble,	0.61	1.91	1.01	0.55	1.45	0.83
Ratio of insoluble to soluble ash,	0.5	2.2	1.1	0.7	2.6	1.7

Analyses by Jones and by the Inland Revenue Laboratory of authentic Canadian syrups and sugars show that they fall within the above mentioned limits.

Jones and Hortvet studied also the detailed composition of the ash of maple sirup and sugar. A summary of the results obtained by the former is as follows:

	In 100 Parts of the Ash			Ratio of		
	CaO	K_2O	SO_3	CaO to (K_2O) 100	CaO to (SO_3) 100	K_2O to (SO_3) 100
Minimum,	18.03	18.26	0.68	57	3.4	1.9
Maximum,	31.74	38.98	2.42	181	12.7	9.4
Average,	22.34	31.45	1.65	141	7.4	5.3

The ratios obtained by Hortvet fall within these limits, except that his maximum for the ratio $CaO: K_2Ox100$ is 17.3, and the ratios $CaO:K_2Ox100$ obtained by Julius Schroeder in the ash of saps from the Norway maple also come within the foregoing limits for this ratio, except in the case of the sap taken from the root of the tree.

At this point we may briefly consider the question whether the clarification of sirups by settling or by filtration may not diminish the quantity of ash and alter its composition, inasmuch as the niter held in suspension in the original sirup or in the solution obtained by "melting" maple sugar, is removed by filtration.

E. N. Eaton recently published results bearing upon this question, and affirmed the need for caution in the condemnation of commercial clarified maple sirups when the limits of quantity or of ratio of components were not fully met.* But Jones and Hortvet, in the studies earlier made, experimented upon the effects of filtration processes which they regarded as more severe than those of commercial practice, and concluded that, while the filtration processes undoubtedly wrought changes in these respects, they did not cause the sirups to fall below the established minima, which Jones expresses as,

"Total ash, not less than 0.50%.
Insoluble ash, not less than 0.15%."

The foregoing figures may be compared with those obtained from *brown sugars* of various grades, the base of most of the substitute or compound sirups. (Bryan)[33]

	Minimum	Maximum	Average
Ash:			
Total, (Per cent.),	0.59	4.33	1.70
Soluble, (Per cent.),	0.46	2.74	1.29
Insoluble, (Per cent.),	0.06	1.59	.41
Alkalinity of ash, (Per Cc.):			
Soluble,	0.15	0.76	.39
Insoluble,	0.15	2.34	.82
Ratio of insoluble to soluble ash,	1.7	16.7	6.2

For *raw cane sugar,* the *filtered sirups* prepared therefrom, and *beet sugar,* the corresponding data compiled by Bryan are as follows:

	Raw Cane Sugar			Cane Sugar Syrups			Beet sugar range
	Minimum	Maximum	Average	Minimum	Maximum	Average	
Ash:							
Total, (Per cent.),	.32	.59	.46	.19	.26	.24	.33— .86
Soluble, (Per cent.),	.10	.41	.25	.11	.16	.14	.31— .78
Insoluble, (Per cent. ,	.18	.23	.21	.08	.10	.09	.02— .08
Alkalinity of ash, (Cc.):							
Soluble,	.18	.36	.29	.22	.24	.23	.38— .40
Insoluble,	.42	.52	.47	.22	.24	.23	.02— .28
Ratio of insoluble to soluble ash,	0.5	2.3	1.27	1.4	1.6	1.5	9.8 —15.5

These data show that brown sugar contains more ash, far more soluble ash, and usually a relatively more alkaline insoluble ash, than maple products possess.

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*Eaton's analyses of syrups before and after settling show very marked difference at the points under consideration. Critical comparison of his results renders doubtful, however, the representative quality of his samples.

Jones found also in brown sugar ash: Lime, 4-21.6%; potash, 30.7-55.4%; sulphuric acid (SO_3), 4.6-17.8%. The corresponding ratios were:

Lime: potash x 100,	257 to 949
Lime: sulphuric acid x 100,	27 to 117
Potash: sulphuric acid x 100,	11 to 58

In other words, the proportions of sulphuric acid and potash, as compared with lime, in the brown sugar ash are far greater than in the maple product ash.

The properties of raw cane-sugar ash fall, it is true, largely within the range of those for maple product ash; but this is not the case with filtered sirups prepared in the usual manner from the raw cane sugars, since the ash of such sirups is less in quantity, at all points, and of lower alkalinity than the maple sirup and maple sugar ashes. Beet sugar ash is distinguished by a low proportion of insoluble ash, and by a correspondingly low alkalinity for insoluble ash, and by a high ratio of the latter to the soluble ash.

Lead Compounds: All genuine maple products yield precipitates upon the addition of lead sub-acetate to their solutions in water. This is due to the fact that the acids, albuminoids and gummy matters present, unite with the lead to form insoluble compounds. Raw cane sugar and cane sirups exhibit a similar behavior, but sirups made from refined sugar give no precipitate by this test. Furthermore, the quantities of the precipitate obtained from unit weights of these several products are more or less characteristic. Hortvet[20] and Jones [27] have devised a method for the centrifugal separation of these precipitates and the measurement of their volumes. The methods require a high degree of exactness in order that closely comparable results may be obtained, but serve well to distinguish between genuine maple sirup and such as are chiefly composed of refined sugar. Sy has made a simple modification, depending upon subsidence for a fixed time rather than upon centrifugal force for the uniform separation preparatory to measurement of the volume of the precipitate.

A more exact method has been worked out by Winton[35], who adds to the diluted sirup or sugar solution an exactly measured quantity of a standard solution of basic lead acetate, the quantity being in excess of the amount required to combine with the various reacting substances present, carefully separating by filtration the insoluble lead compounds, and determining exactly the residual lead in the solution. By difference, the lead taken into combination is determined. The weight of lead combining with the reacting substances in 1 gram of the sugar or sirup is termed the "lead number" of the maple product under examination.

Winton found that 8 genuine maple sirups gave lead numbers of 1.20 to 1.77; and 7 maple sugars of 1.83 to 2.38, adulterated samples of sirup gave from 0.022 to 0.92. Bryan[36] states the range in lead numbers from all determinations made up to 1908, upon authentic samples, is as follows:

Maple syrup,	1.19 to 2.03; average, 1.49
Maple sugar,	1.83 to 2.48; average, 2.23

McGill has devised a simple method in which the washed subacetate precipitate is dried, weighed, and the weight multiplied by the factor 22.22 (assuming 10% of water in maple sugar), to give the *lead subacetate number* for the maple sugar equivalent of the sirup used. The Winton lead number is 71% of the lead sub-acetate number obtained by McGill's method.

Of 456 manufacturers' samples of maple sirup submitted with a declaration of purity and description of the process of manufacture, 31 samples gave lead subacetate numbers below 2.00%; 29 of these lying between 1.50 and 2.00%, and two falling below 1.50%.

Of these manufacturers' samples, 47 examined by the Winton method gave lead numbers as follows: maximum 2.38; minimum, 1.05; average, 1.75.

McGill concludes that the improved methods of manufacture tend to decrease these lead numbers to figures at least as low as 1.50 for the lead subacetate number, and 1.10 for the Winton number.

Malic acid value: Advantage has been taken of the facts that the distinctive acid of maple products is malic acid and that, when, to a hot neutral solution of this acid, dissolved calcium chlorid and strong alcohol are added, calcium malate is precipitated as an insoluble salt, which may then be separated and weighed. Hortvet[37] adapted to this purpose the method devised by Leach and Lythgoe[38] for the estimation of malic acid in cider vinegar. The modified method does not involve the weighing of the insoluble calcium salt, but its destruction by burning and the determination of the quantity of standard acid required to neutralize the residual lime or lime carbonate, yielded by a standard weight of the maple product examined. The precipitate actually contains compounds other than calcium malate, but the rather arbitrary method gives "malic acid values" which are, nevertheless, quite characteristic for maple products. Hortvet and also Jones[18] applied this method to authentic samples and obtained results of somewhat divergent range:

MALIC ACID VALUE

Maple syrup:	
Hortvet,	0.84 to 1.76, average 1.07
Jones,	0.41 to 0.72, average 0.53
Maple sugar:	
Hortvet,	0.98 to 1.67, average 1.29
Jones,	0.65 to 0.84, average 0.75

That is, for some reason not apparent in the descriptions of the work, Jones obtained values about one-half as great as those reported by Hortvet.

McGill[22] examined 452 maple sirups submitted as genuine by their makers, and found malic acid values ranging from 0:50 to 1.00 in 96% of the samples. He says, "It is safe to infer that samples giving less than 0.5 or more than 1.0 as malic acid values, are exceptional. But it must be borne in mind that individual samples, guaranteed as genuine, give as low a malic acid number as 0.30; while 2% of the present collection gave malic acid values below 0.4." This investigator thinks that sirup from the soft maple has a lower malic acid value than that from the hard maple.

The method has value as confirmatory of the lead numbers, which represent practically the same constituents of the maple products. Hortvet obtained from brown sugars, malic acid values of 0.08 to 0.18; and Bryan notes an average of 0.35 for filtered sirups prepared from raw cane sugar, and of 0.08 for beet sugar. Jones observes that the malic acid value of a filtered maple sirup, whether made by direct evaporation or by the melting of maple sugar, is only about four fifths of the value exhibited immediately prior to filtration.

Sy[34] has suggested two additional preliminary tests.

Foam test: On the observation that maple products foam more when shaken than do cane sugar sirups, the following test was based: In a narrow cylinder graduated to 0.1 cubic centimeters, mix 5 cc. of sirup and 10 cc. of water by vigorous shaking for one-half minute. Allow the cylinder to stand for ten minutes, and then measure the volume of the foam on top of the mixture.

According to Sy, maple sirups show from 3.0 to 6.0 cc.; average, 4.1 cc. of foam; while adulterated or mixed products give less than 3.0 cc.

Color test: Noting that the color of maple products is due in part to caramel, but in part also to other bodies; that caramel is insoluble in amyl alcohol, the other coloring bodies soluble; that while the latter are soluble also in water, they are relatively less soluble in water containing free phosphoric acid, Sy devised the following test: In a narrow tube or cylinder, to 15 cc. of the sirup (or 15 grams of sugar made up with water to 15 cc. volume) add 3 cc. of pure amyl alcohol and 1 cc. of a 20 per cent. solution of phosphoric acid, shake thoroughly, let stand until the alcohol separates and then note the color of the amyl alcohol layer. According to Sy, pure maple products always give a decided brown color; cane sugar products colored with caramel, no color; mixtures, from a trace of color to a light brown, according to the quantity of maple present.

Aroma test: Jones[40] declares that, upon heating, maple products emit an aroma distinguished readily from those given off by all maple imitations. The better to set free the volatile aromatic principles, which appear to become "bound" in old goods, 20 to 40 cc. of water is mixed with 20 grams of the material to be tested, and then the vessel containing the mixture is gently heated to boiling upon an asbestos plate. The mixture should be so diluted as to boil at 215° C.

For the application of this method, a wide range of experience with known materials is manifestly required.

EXAMINATION OF MARKET MAPLE SIRUPS

Of the official samples of sirup submitted for examination, 56 purported to be maple sirups, pure or compound. The labels of 31 samples indicated the goods to be compound; those of 25 represented the sirups to be pure maple sirups.

In view of the misbranding prohibitions of the Food Act of May 13th, 1909, these samples were divided into two groups, the first of which purport to be pure; the second, compound.

MAPLE SIRUPS PURPORTING TO BE PURE

Group I.

In the following tabulations are stated:

a. The group number.
b. The Special Agent's serial number.
c. The name and address of the manufacturer or distributor, where they are stated on the label.
d. The brand name of the sirup.
e. Any added remarks concerning the purity of the goods, or the quantity contained in the package.
f. The name and address of the vender from whom the sample was purchased
g. The price paid for the sample.

* Appended to the brand name signifies that the label declares that a guaranty of conformity of the article to the requirements of the National Food and Drug Act of June 30, 1906, has been filed with the Secretary of Agriculture by the manufacturer.

† Signifies that the container is made of tin-plate; unless otherwise indicated, the containers are of glass.

Group No.	Agent's No.	
1.	3243	Finley Acker Co., Philadelphia, Pa. "H. G." Extra Fancy Genuine Vermont Maple Syrup, Absolutely Pure. Finest Obtainable. Bought of Finley Acker Co., Philadelphia, Pa. Price, 35 c.
2.	3149	Austin, Nichols & Co., New York: Sunbeam Brand Maple Syrup.* Bought of Market, 81 S. Main St., Wilkes-Barre, Pa. Price, 30 c.
3.	3213	Austin, Nichols & Co., New York: Sunbeam Brand Maple Syrup.* Bought of Gohl & King, Williamsport, Pa. Price, 25 c.
4.	3247	Bay State Maple Syrup Co., Boston, Mass.: Mount Washington Maple Sap Syrup, Highest Quality. Absolutely Pure. Bought of Showell, Fryer & Co., Juniper and Market Sts., Philadelphia, Pa. Price, 25 c.
5.	3158	Curtice Brothers Co., Rochester, N. Y. Blue Label Sap Maple Syrup. Guaranteed Absolutely Pure. Bought of Franklin Grocery Co., Lancaster, Pa. Price, 35 c.
6.	3228	The Wm. Edwards Co., Cleveland, O. Edwards Pure Maple Syrup.* Bought of Wm. Schultz, 2426 Peach St., Erie, Pa. Price, 40 c.
7.	3240	Gimbel Bros., Philadelphia, Pa. Distributors: Lenox Brand Sap Maple Syrup. Bought of Gimbel Bros., Philadelphia, Pa. Price, 35 c.
8.	3198	The Great Atlantic and Pacific Tea Co., Jersey City, N. J. Distributors: A. & P. Pure Maple Syrup*. Bought of A. & P. Tea Co., 614 Penn St., Reading, Pa. Price, 10 c.
9.	3260†	M. J. Hapgood, Peru, Vt. Pure Vermont Maple Syrup. Bought of Abraham & Bro., 693 Northampton St., Easton, Pa. Price, 28 c.
10.	3206	Name and Address of manufacturer not given; Hazen's Vermont Syrup, Warranted: Hobbs Bros., 26 Centre St., Shenandoah, Pa. Metal screw cap marked "Hazen's Pure Vermont Maple Syrup." Price, 25 c.
11.	3160	Huntington Maple Syrup & Sugar Co., Huntington, Vt., and Providence, R. I. Gold Leaf Brand, Pure Vermont Syrup. Put up expressly for First Class Trade. Bought of D. P. Lentz, Lancaster, Pa. Price, —.
12.	3156	The F. N. Johnson Co., Bellefontaine, O.: Native Purity Pure Maple Syrup.* Bought of Jno. L. Binkley, Lancaster, Pa. Price, 40 c.
13.	3148	Francis H. Leggett & Co., New York. Distributors: Premier Pure Sap Maple Syrup. Bought of O. G. Coursen, Scranton, Pa. Price, 30 c.
14.	3214	New England Maple Syrup Co., Fairfax and St. Johnsbury, Vt., and Boston: New England Vermont Maple Sap Syrup, Choicest Quality. Absolutely Pure. Bought of C. W. Hicks, Market St., Williamsport, Pa. Price, 45 c.
15.	3203	Rigney & Co., Rutland, Vt., and Brooklyn, N. Y.: Colonial Brand Pure Vermont Maple Syrup. "We guarantee this syrup to be absolutely free from glucose, preservatives, or other adulterants." Bought of E. E. Brobst, Cor. Jordan and 7th Sts., Shenandoah, Pa. Price, —.
16.	3261	Rigney & Co., Brooklyn, N. Y. Colonial Brand Pure Maple Sap Syrup.* Bought of Floyd Bush, 45 Fourth St., Easton, Pa. Price, 35 c.

Group No.	Agent's No.	
17.	3147	S. B. Rogers, Elmira, N. Y. Pure Maple Syrup. Bought of E. G. Coursen, Scranton, Pa. Price, 50 c.
18.	3162	R. C. Seldomridge, Lancaster, Pa. Sap Maple Syrup, Absolutely Pure. Bought of R. C. Seldomridge, Lancaster, Pa. Price, 30 c.
19.	3279	Sprague, Warner & Co., Chicago, Ill. Distributors: Ferndell Brand Maple Syrup. (One Pint.) Bought of Gettysburg Department Store, Gettysburg, Pa. Price, 35 c.
20.	3202	F. G. Strohmeyer & Co., New York. Pure Maple Syrup, Delicious and Wholesome. Bought of S. Davies, Shenandoah, Pa. Price, 25 c.
21.	3229	The Towle Maple Product Co., St. Johnsbury, Vt., and St. Paul, Minn. Towle's Vermont Maid Brand Sap Maple Syrup.* (Log Cabin Trade Mark) (One Pint Full Measure). Bought of Kauffman, Pittsburg, Pa. Price, 30 c.
22.	3230†	M. H. Tweed & Co. (M. H. Tweed, Harry F. Botsford), Pittsburg. Tweed's Maple Syrup, Absolutely Pure ("Guarantee: Maple Syrup made directly from the sap is much superior in flavor to that made from maple sugar. We guarantee this to be absolutely pure sap syrup"). Made from the sap of the maple. Bought of Kauffman's, Pittsburg, Pa. Price, 40 c.
23.	3126	Welch Bros. Maple Co., Burlington, Vt., Vermont's Finest Quality Pure Maple Sap Syrup.* Green Mountain Bay. Bought of Dives, Pomeroy & Stewart, Harrisburg, Pa. Price, —.
24.	3152	R. C. Williams & Co., New York, Distributors: The Famous Royal Scarlet Brand Genuine Sap Maple Syrup.* Bought of Mohican Co., Wilkes-Barre, Pa. Price, 45 c.
25.	3207	R. C. Williams & Co., Cor. Hudson and Thomas Sts., New York. Elite Maple Syrup. Bought of Hobbs Bros., Shenandoah, Pa. Price, 25 c.

EXAMINATION OF THE SIRUPS

The maple sirups were examined by both physical and chemical tests, as follows:

Physical:	
1.	Refractive index at 28° C. by use of an Abbe refractometer with heating prism.
2.	Specific gravity at 20° C. by use of the Westphal balance.
3.	Polarization by use of a Schmidt-Haensch double-wedge polariscope, standardized by use of standard quartz plates: Readings were taken (a) Direct at 20° C.; (b) after inversion by the Clerget process, at 20° C.; and (c) after inversion at 87° C., and are expressed in degrees, Ventzke.
4.	Sy foam test.
5.	Sy color test.
Chemical:	
6.	Total solids, computed from the refractive indices by use of Geerlig's table. The selection of this basis of computation rather than the specific gravity was determined by Bryan's studies of the accuracy of the method as applied to maple products.
7.	Cane-sugar (sucrose) by use of the Clergot formula; expressed for direct and invert readings taken at 20° C.:

$$\text{Sucrose} = \frac{(\text{Direct reading—indirect reading, Ventzke degrees}) \times 100}{132.66}$$

8.	Reducing sugars (invert sugars) by copper reduction (Munson and Walker's table).
9.	Total ash.
10.	Water-soluble ash (by difference).

11. Water-insoluble ash.

12. Alkalinity of water-soluble ash, per gram of sirup.

13. Alkalinity of water-insoluble ash, per gram of sirup.

14. Ratio, $\frac{\text{Water-soluble ash.}}{\text{Water-insoluble ash.}}$

15. Sulphuric acid (SO_3) in total ash.

16. Lead number (Winton).

17 Malic acid value (Hortvet).

18. Qualitative test for benzoic and salicylic acids, and for saccharin.

These determinations, except as noted below, were made according to the official methods, or, in case where no method has been officially adopted, as described by Bryan.

GROUP I. "PURE" MAPLE SIRUPS
Physical Properties and General Composition.

Group Number.	Agent's number.	Refractive index at 21° C.	Specific gravity.	Polarization (V°).			Sy foam test. Cc.	Moisture.	Total solids (Geerlig.)	Sucrose (Clerget formula).	Invert sugar.	Ash.	Acids, gum, albumen, coloring matter, etc. By difference.
				Before inversion at 20° C.	After inversion at 20° C.	After inversion at 87° C.							
								%	%	%	%	%	%
1,	3243	1,4573	1,328	+62.0	—18.92	+4.84	4.5	32.75	67.25	59.45	5.00	.45	2.35
2,	3149	1,4547	1,331	+50.7	—19,25	+2.86	5.0	33.85	66.15	52.69	6.22	.62	6.82
3,	3213	1,4570	1.328	+55.8	—20.9	+3.22	4.5	32.90	67.10	57.77	6.52	.61	2.20
4,	3247	1,4558	1,333	+56.0	—17.82	+4.6	4.0	33.35	66.65	55.60	2.19	.53	8.93
5,	3158	1,4611	1,344	+58.5	—22.66	+0.33	5.0	31.10	68.90	61.13	3.09	.46	4.22
6,	3228	1,4604	1,341	+57.5	—21.23	+0.44	4.2	31.45	68.55	59.30	3.14	.45	5.66
7,	3240	1,4661	1.333	+58.0	—20.24	+4.4	5.3	38.05	70.95	58.93	4.39	.51	7.12
8,	3198	1,4518	1.321	+50.1	—20.35	+1.1	4.5	35.10	64.90	53.06	5.58	.54	5.72
9,	3260	1,4499	1.317	+59.2	—19.58	+4.4	3.0	35.90	64.10	59.34	3.04	.55	1.17
10,	3206	1.4484	1.309	+50.5	—19.36	0.0	3.0	36.55	63.45	52.62	6.02	.13	4.68
11,	3160	1.4623	1.345	+52.0	—20.9	+1.54	2.2	30.65	69.35	54.91	8.28	.40	5.76
12,	3156	1,4672	1.364	+60.8	—23.98	+0.22	4.6	28.60	71.40	63.86	3.54	.60	3.40
13,	3148	1,4568	1.328	+59.0	—21.78	+1.76	3.3	33.10	66.90	60.85	1.97	.50	3.58
14,	3214	1.4605	1.339	+60.0	—22.44	—0.22	5.1	31.40	68.60	62.10	5.48	.51	.51
15,	3203	1,4533	1.329	+47.7	—21.78	+0.26	6.2	34.45	65.55	52.33	1.28	.74	11.20
16,	3261	1.4505	1.320	+57.4	—19.8	+4.4	3.0	35.65	64.35	58.15	8.60	.56	---------
17,	3147	1.4593	1.337	+36.0	—14.52	+1.54	1.8	31.90	68.10	37.95	4.12	.58	25.45
18,	3162	1.4566	1.331	+50.4	—21.56	0.0	4.8	33.00	67.00	54.20	8.65	.63	3.52
19,	3279	1.4573	1.333	+59.0	—22.4	0.0	5.0	32.75	67.25	58.55	3.11	.56	5.03
20,	3202	1.4514	1.312	+21.6	—20.02	+2.42	4.4	35.25	64.75	29.04	13.38	.27	22.06
21,	3229	1.4601	1.342	+62.3	—22.0	+2.88	5.0	31.55	68.45	63.34	4.57	.54	---------
22,	3230	1,4550	1.334	+54.8	—19.36	+2.2	3.8	33.70	66.30	55.86	7.14	.52	2.78
23,	3126	1.4536	1.324	+37.4	—22.66	—1.10	4.0	34.30	65.70	45.19	16.46	.57	3.48
24,	3152	1.4448	1.316	+51.8	—20.02	+1.45	4.1	38.10	61.90	54.10	3.71	.42	3.67
25,	3207	1.4559	1.332	+48.4	—15.29	+5.5	4.2	33.30	66.70	47.97	14.95	.31	3.47

GROUP I. "PURE" MAPLE SIRUPS

SPECIAL CHEMICAL CHARACTERS.

Group Number.	Ash.			Alkalinity of Ash.		Sulphuric acid (SO_3).			
	a. Water soluble.	b. Water insoluble.	Ratio, a/b.	Water soluble. Cc.	Water insoluble. Cc.	In syrup.	In ash.	Lead number.	Malic acid value.
	%	%	%			%	%		
1,	.292	.165	1.77	.425	.415	.0048	1.05	1.36	.51
2,	.469	.155	3.03	.715	.490	.0132	2.12	1.52	.72
3,	.367	.240	1.53	.530	.550	.0077	1.27	1.45	.34
4,	.379	.150	2.53	.505	.445	.0077	1.46	1.40	.65
5,	.249	.212	1.18	.125	.460	.0041	1.65	1.49	.61
6,	.317	.130	2.44	.410	.290	.0087	1.96	1.42	.61
7,	.351	.160	2.19	.475	.445	.0082	1.60	1.32	.37
8,	.363	.182	1.99	.430	.405	.0061	1.12	1.56	.57
9,	.365	.185	1.97	.445	.570	.0074	1.35	1.45	.76
10,	.077	.058	1.33	.105	.075	.0027	2.72	.09	.15
11,	.181	.145	1.25	.320	.405	.0043	1.07	.66	.32
12,	.394	.207	1.90	.475	.450	.0116	1.91	1.45	.52
13,	.345	.160	2.66	.460	.510	.0082	1.62	1.48	.91
14.	.321	.190	1.69	.435	.460	.0053	1.04	1.33	.53
15,	.621	.122	5.07	.880	.310	.0396	5.32	1.28	.33
16,	.382	.178	2.14	.420	.475	.0115	2.05	1.37	.77
17,	.477	.103	4.63	.430	.350	.0120	2.07	1.08	.57
18,	.427	.200	2.13	.450	.440	.0102	1.63	1.41	.62
19,	.392	.171	2.30	.480	.475	.0091	1.61	1.46	.76
20,	.185	.092	2.01	.265	.245	.0024	.90	.80	.30
21,	.400	.145	2.76	.460	.515	.0026	.48	1.46	.63
22,	.350	.172	2.03	.410	.515	.0072	1.38	1.41	.68
23,	.397	.178	2.23	.470	.530	.0130	2.26	1.27	.79
24,	.246	.174	1.41	.325	.425	.0104	2.47	1.22	.63
25,	.217	.095	2.29	.270	.260	.0077	2.47	1.19	.46

DISCUSSION

Preservatives and saccharin were not found in any case.

The solids in these sirups varied from 61.9 to 71.4%, or, excluding the lowest case, the minimum was 63.45%. Only one-third of the samples reached the national standard of 68%. Of this third, none exhibited any troublesome tendency toward crystallization. Nearly one-fourth fell below the Canada standard (65% solids).

In no case, among these twenty-five samples, was any glucose found. The percentage of invert sugar was, however, surprisingly high in some instances; as was that of the undetermined group,—acids, gums, coloring matters, etc.

Bryan noted that solutions of maple sugar inverted and heated to 87°C., gave, in most cases, a small right-hand rotation. The same fact appears in our determinations. This may be due to the conversion of a little of the easily destructible levulose to an inactive substance under the influence of the heat and of the other constituents of the solution.

The quantity of ash fell below Bryan's minimum in 7 cases, in but three of which was the deficiency very great, viz., in Group Nos. 10, 20, and 25.

The quantity of water-soluble ash fell below Bryan's minimum in the cases of Nos. 10, 11 and 20; those for insoluble ash, in Nos. 6, 10, 15, 17, 20 and 25; while the ratios between these constituents exceeded the normal limits in the cases of Nos. 15 and 17 only.

The alkalinity of the water-soluble ash fell below normal in the cases of Nos. 5 and 10, and exceeded the maximum in the cases of Nos. 2 and 15; while the alkalinity of the insoluble ash fell below the normal minimum in the cases of Nos. 6, 10, 20 and 25.

The percentage of sulphuric acid in the ash exceeded the range found by Jones in but three cases, Nos. 10, 15 and 21.

The lead numbers, for which the normal range for genuine maple sirups, is stated by Bryan as 1.19 to 2.03, in these commercial samples ran from .09 up to 1.56. The cases falling below the Bryan minimum were Nos. 10, 11 and 20.

The malic acid values found for these commercial samples ranged from .15 to .79, but were not strictly proportioned to the corresponding lead numbers. Values less than the Jones minimum were obtained in the cases of Nos. 3, 7, 10, 11, 15 and 20.

The Sy foam test has not, in our hands, given indications in close accord with those afforded by the more elaborate methods above discussed. Quantities less than 3.0 cc., Sy's minimum for genuine sirups, were observed only in cases of Nos. 11 and 17.

Giving careful consideration to the foregoing instances of departure from normal, it is clear that No. 10 is not only below standard in concentration, but that its solids exhibit at nearly every point, the characters of a mixture of a large proportion of another sugar (probably granulated sugar) with the maple sugar. In the case of No. 15, the slight deficiency in insoluble ash would, of itself, not be seriously significant, but considered with the high ratio of insoluble to soluble ash, the unusual alkalinity of the latter, the high sulphuric acid content of the ash and the low malic acid value, constitutes strong evidence of the admixture of a foreign sugar, probably brown sugar, with the maple; in the case of No. 17, appear features similar in most respects, but less convincing in degree. No. 20, like No. 10, shows pronounced evidence of admixture with a large proportion of granulated sugar; the same is true of No. 25, although the effects do not manifest themselves at so many points. No. 20 was badly fermented when the package was opened, and the fermentation may have modified the lead number and malic acid values, as well as the condition of the sugars.

COMPOUND MAPLE SIRUPS.

Of this class of sirups, 32 samples were examined in the same particulars with the sirups purporting to be pure.

Eaton[32] studied the composition of mixed sirups prepared with different stated proportions of a clarified maple sirup and a plain sugar sirup, and concluded that the mixing resulted in important departures from the theory in the quantities, though not the specific alkalinity of the ash, the quantities of the lead precipitate and the Hortvet numbers obtainable, with the effect of securing upon the analysis of the mixtures indications of the presence of much smaller proportions of maple sirup than were actually present. Comparison of the several analyses of the individual ingredients and of the mixtures show, however, that the analyses of the mixtures correspond closely with those computed from the composition of the ingredients at all points save the Hortvet number, and accordingly indicate that the quantity and alkalinity of the ash, and the quantity of the lead subacetate precipitate afford safe guides in estimating the maximum proportion of maple sirup present in a "cane and maple" sirup, at least down to a proportion of one part of the latter to three of the cane sirup.

The description of the agent's samples follows:

MIXED MAPLE SIRUPS

Group No.	Agent's No.	
1.	3197	Austin, Nichols & Co., New York: Hudson Brand Syrup.* A blend made from Cane and Maple Sugar. Bought of Wm. Lender & Co., Reading, Pa. Price, —.
2.	3157	Austin, Nichols & Co., New York: Cane and Maple Syrup. A Blend made from Pure Refined Cane and Maple Sugar. Bought of Fisher Bros., Lancaster, Pa. Price, —.
3.	3188	J. H. Barker & Co., 447 W. 31st St., New York: Barker's Brand Table Syrup.* A mixture of Rock Candy Syrup and Maple Syrup. Bought of Geo. M. Leiss & Co., Reading, Pa. Price, —.
4.	3245†	J. H. Barker & Co., 447 W. 31st St., New York: Old Time Syyrup.* This syrup is composed of the following ingredients and none other: Pure Cane and Maple Sugar. (28g.) "Guaranty: Absolutely free from Glucose, Grape Sugar. Flavoring matter and every other adulterant." Bought of Merrill & Hopper, Filbert St., Philadelphia, Pa. Price, —.
5.	3155	Bay State Maple Syrup Co., Boston, Mass. Moosehead Brand Fancy—Sugar Syrup blended of Cane and Maple Sugar Syrup. Bought of Childs Grocery Co., Lancaster, Pa. Price, —.
6.	3268	Bay State Maple Syrup Co., Boston, Mass. Mt. Mansfield Brand Fancy—Sugar Syrup. Blended of Cane and Maple Sugar Syrup. HIGH GRADE MAPLE PRODUCTS. Bought of Myers, Wells & Co., York. Pa. Price, —.
7.	3151	Boyle & Williams, Bradford, Pa. Silver Seal Table Syrup. A MAPLE FLAVORED SUGAR SYRUP. Bought of Mohican Co., Wilkes-Barre, Pa. Price, —.
8.	3221	J. W. Brooks, Erie, Pa. Brooks' Cream Syrup. Made from Cane Sugar and Pure Maple Syrup. Bought of Jno. F Leiser, Erie, Pa. Price, —.

Group No.	Agent's No.	
9.	3189	Fred Fear, 15 Jay St., New York: My Wife's Syrup.* A Delicious Blend of Pure Cane and Maple. Bought of J. H. Cassel, Reading. Price, —.
10.	3239	Gimbel Bros., Philadelphia. Lenox Brand, Cane and Maple Syrup. Bought of Gimbel Bros., Philadelphia, Pa. Price, —.
11.	3278	Githens, Rexamer & Co., Philadelphia, Pa. Melrose Brand Syrup. Blend Composed of Sugar Cane Syrup Flavored with Maple Syrup. (Net weight 25 oz.) (Bottled molded with name of the Towle Maple Syrup Company.)
12.	3222†	C. W. Goyer & Co., Memphis, Tenn. Goyer's Maple Cane Syrup. (Device, Stalk of cane crossed by large maple leaf.) In small capitals on rear label: "Made of Pure Maple and Louisiana Cane Sugar." Bought of G. D. Williams, 721 State St., Erie, Pa. Price, —.
13.	3139	Halpen, Green & Co., Philadelphia: Apollo High Grade Vermont Style Syrup. Blended of Cane and Maple Sugar Syrup. Bought of C. W. Purse Co., Harrisburg, Pa. Price, —.
14.	3276	Halpen, Green & Co., Philadelphia: Apollo Brand Cane and Maple Syrup. (Foil Cap: High Grade Maple Products.) Bought of People's Cash Store, Gettysburg, Pa. Price, —.
15.	3192	Huntington Maple Syrup and Sugar Co., E. Providence, R. I., Golden Leaf Syrup.* Made from Refined Cane and Maple Sugar. Bought of E. W. Michael, Reading. Price, —.
16.	3270	The F. N. Johnson Co., Bellefontaine, Logan Co., O. Wild Forest Brand Syrup.* Cane and Maple. Bought of F. B. Gross, York, Pa. Price, —.
17.	3186	Francis H. Leggett & Co., New York: Nabob Cane and Maple Sugar. Pancake Syrup. Bought of A. S. Dester, Reading, Pa. Price, —.
18.	3262	Leslie, Dunham & Co., Jersey City and Newark, N. J. Green Mountain Brand Syrup.* On the rear label: Made from the Finest Selected Cane and Maple Sugars. Bought of J. Schulers, Easton, Pa. Price, —.
19.	3195	Nassau Packing Co., New York. Vermont Maple Syrup. (Sticker on main label "COMPOUND.") Bought of Cassel's Cut Rate Grocery, Penn St., Reading, Pa. Price, —.
20.	3277	New England Maple Syrup Co., Fairfax St., Johnsbury, Vt. Boston, Mass. Golden Tree Brand Fancy Quality Syrup. Made from Pure Maple and White Sugar. Bought of P. A. Miller, Gettysburg, Pa. Price, —.
21.	3142	New England Maple Syrup Co., Boston. Golden Tree Syrup.* Made from Granulated and Maple Sugars. Bought of R. J. Peters & Son, Harrisburg, Pa. Price, —.
23.	3126	Rigney & Co., Brooklyn, N. Y. Aunt Jemima's Pancake Syrup.* A Blend of Rock Candy and Maple Syrup. Bought of Z. Gray & Co., Williamsport, Pa. Price, —.
22.	3125	Philadelphia Pickling Co's Superior Vermont Syrup. Pure Maple and Cane Sugar. Bought of Dives, Pomeroy & Stewart, Harrisburg, Pa. Price,—.
24.	3275	Rigney & Co., Brooklyn, N. Y. Park Brand Maple and Rock Candy Syrup.* Bought of People's Cash Store, Gettysburg, Pa. Price, —.
25.	3140	Rigney & Co., Brooklyn, N. Y. Park Brand Syrup.* A Blend of Rock Candy and Maple Syrup. Bought of H. B. Wolbert, Harrisburg, Pa. Price, —.
26.	3209	A. B. Rogers, Elmira, N. Y. Peerless Table Syrup. Blended. Made from Maple and ?
27.	3271	Scudder Syrup Co., Chicago, Ill. Scudder's Syrup.* Pure Sugar Cane and Canada Sap-Maple and Full Measure. Absolutely Pure, Bought of R. B. Montgomery, Lewistown, Pa. Price, 25 c.
28.	3269	Thompson, 259 Greenwich St., New York. Thompson's Choice Table Syrup.* "This syrup is made from pure cane and maple sugar and preserved with 1/10 of 1 per cent. of sodium benzoate." On the back: "The Ingredients of this syrup are absolutely pure and wholesome the adding of granulated sugar giving richness and body, and permitting this syrup to be sold at a reasonable and not a prohibitive price." Bought of C. J. Halfrick, 240 S. George St., York, Pa. Price, 20 c.

Group No.	Agent's No.	
29.	3205†	The Towle Maple Syrup Co., St. Paul, Minn. Towle's Log Cabin Syrup (in large white letters on red ground). Cane Sugar and Maple Sugar (in small black caps on red ground). (One Pint). Bought of Cox Bros., Shenandoah, Pa. Price, 25 c.
30.	3131	The Towle Maple Products Co., St. Paul, Minn., St. Johnsbury, Vt., Towle's Log Cabin Syrup. (Cane and Maple Sugar in small black caps on red ground. Main brand name in large white caps on red ground.) (Bottle mold bears imprint of Towle Maple Syrup Co.) Bought of S. S. Pomeroy, Harrisburg. Price, 30 c.
31.	3204	The Towle Maple Syrup Co., St. Paul, Minn. Towle's Log Cabin Sugar Syrup and Maple Syrup. Bought of Cox Bros., 9 West Centre St., Shenandoah, Pa. Price, 30 c.
32.	3201	R. C. Williams & Co., New York. Robin Hood Brand Breakfast Syrup. Selected Pure Maple and Cane Sugar. Bought of S. Davies, 21 Jordan St., Shenandoah, Pa. Price, 25 c.

GROUP II. COMPOUND MAPLE SIRUP

PHYSICAL PROPERTIES AND GENERAL COMPOSITION.

Group Numbers.	Agent's number.	Refractive index at 21° C.	Specific gravity.	Polarization (V°). Before inversion at 20° C.	Polarization (V°). After inversion at 20° C.	Polarization (V°). After inversion at 87° C.	Sy foam test. Cc.	Moisture.	Total solids (Geerlig).	Sucrose (Clerget formula).	Invert sugar.	Ash.	Acids, gum, coloring matter, etc. By difference.
								%	%	%	%	%	%
1,	3197	1.4505	1.323	+56.8	—20.3	+0.22	0.7	35.65	64.35	57.98	4.43	.05	1.89
2,	3157	1.4528	1.325	+60.5	—22.1	+1.10	3.2	34 65	65.35	62.22	2.33	.40	.40
3,	3188	1.4568	1.331	+52.1	—22.1	+0.22	2.9	32.95	67.05	55.90	8.86	.14	2.15
4,	3245	1.4543	1.330	+66.0	—19.8	+4.84	1.0	34.00	66.00	64.68	1.36	.11	—0.15
5,	3155	1.4519	1.322	+54.3	—20.9	+0.33	0.0	35.05	64.95	56.64	4.28	.10	3.93
6,	3268	1.4606	1.340	+60.6	—22.4	0.0	1.0	31.35	68.65	62.52	2.98	.18	2.97
7,	3151	1.4524	1.300	+58.9	—20.9	+0.22	0.5	34.85	65.15	60.11	1.51	.07	5.81
8,	3221	1.4568	1.338	+64.6	—21.8	+4.62	1.7	32.95	67.05	64.51	2.67	.15	—0.18
9,	3189	1.4537	1,324	+60.5	—21.78	+1.10	0.5	34.25	65.75	61.96	2.81	.06	0.92
10,	3239	1.4537	1.326	+49.0	—19.8	+3.3	1.8	34.25	65.75	51.86	8.24	.09	5.56
11,	3278	1.4643	1.342	+65.6	—23.8	0.0	2.2	29.85	70.15	67.34	1.40	.11	1.30
12,	3222	1.4794	1.391	+119.20	+88.0	+92.62	1.5	23.70	76.30	23.51	25.69	.29	26.81
13,	3139	1.4583	1.336	+59.6	—23.1	+0.66	0.2	32.30	67.70	45.24	6.93	.16	15.37
14,	3276	1.4632	1.348	+66.2	—23.1	—0.20	2.3	30.25	69.75	67.26	.97	.27	1.25
15,	3192	1.4570	1.336	+59.8	—21.4	0.0	1.9	32.90	67.10	61.20	3.62	.08	2.20
16,	3270	1.4590	1.333	+48.8	—22.4	0.0	2.4	32.00	68.00	53.63	9.51	.34	4.52
17,	3186	1.4543	1.320	+55.5	—21.56	+0.44	0.7	34.00	66.00	58.04	5.47	.14	2.35
18,	3262	1.4653	1.333	+51.2	—19.8	+5.28	2.2	29.40	70.60	53.48	15.87	.13	0.32
19,	3195	1.4582	1.337	+73.2	+50.8	+58.5	0.2	32.35	67.65	16.89	27.07	.18	33.51
20,	3277	1.4607	1.341	+61.4	—24.0	+0.40	1.2	31.30	68.70	64.32	3.79	.24	0.35
21,	3142	1.4615	1.343	+63.4	—22.2	+1.54	0.5	31.00	69.00	64.49	1.33	.15	3.03
22,	3125	1.4465	1.298	+51.0	—21.12	+1.32	0.0	37.40	62.60	54.38	5.13	.22	2.93
23,	3216	1.4590	1.335	+57.2	—20.3	+1.54	2.5	32.00	68.00	58.46	7.52	.15	1.83
24,	3275	1.4513	1.315	+52.0	—22.0	—0.40	1.5	35.30	64.70	55.74	7.35	.11	1.80
25,	3140	1.4578	1.333	+41.0	—17.16	+3.08	5.5	32.50	67.50	44.14	18.30	.13	4.93

26.	3209	1.4606	1.337	+59.9	—20.46	+1.54	0.6	31.35	68.65	60.57	4.48	.	3.18
27,	3271	1.4571	1.326	+59.0	—22.9	0.0	4.0	32.85	67.15	61.69	2.75	.	2.57
28,	3269	1.4598	1.335	+63.6	—22.0	—0.20	0.3	31.70	68.30	64.48	.40	.	3.34
29,	3205	1.4619	1.348	+51.0	—16.5	+3.96	5.5	30.85	69.15	56.04	10.49	.	2.39
30,	3131	1.4648	1.337	+61.0	—20.3	+3.85	2.0	29.60	70.40	61.28	3.21	.	5.77
31,	3204	1.4601	1.345	+59.0	—22.0	+0.66	3.7	31.55	68.45	61.06	13.68	.	—6.47
32,	3201	1.4508	1.315	+25.8	—17.71	+2.20	6.1	35.50	64.50	32.80	22.76	.	8.88

GROUP II. COMPOUND MAPLE SIRUP

SPECIAL CHEMICAL CHARACTERS.

Group Number.	Ash.		Ratio, a/b.	Alkalinity of Ash.		Sulphuric acid (SO_3).		Lead number.	Malic acid. Value.
	a. Water soluble.	b. Water insoluble.		Water soluble. Cc.	Water insoluble. Cc.	In syrup.	In ash.		
	%	%	%	%	%	%	%		
1,	.031	.018	1.72	.05	.07	.0027	5.51	.17	.20
2,	.352	.05	6.71	.44	.14	.0061	1.51	.11	.03
3,	.085	.060	1.42	.13	.16	.0032	2.21	.27	.00
4,	.055	.052	1.06	.08	.10	.0033	3.09	.23	.15
5,	.076	.022	3.40	.11	.05	.0039	3.94	.00	.25
6,	.100	.081	1.23	.15	.23	.0065	3.60	.53	.26
7,	.041	.032	1.28	.07	.10	.0039	5.27	.26	.30
8,	.104	.051	2.04	.12	.15	.0005	.32	.45	.27
9,	.041	.023	1.77	.06	.07	.0029	4.46	.19	.07
10,	.062	.025	2.48	.10	.06	.0043	4.94	.03	.25
11,	.070	.037	1.87	.11	.12	.0029	2.71	.18	.26
12,	.212	.083	2.55	.29	.12	.0257	8.71	.31	.20
13,	.127	.035	3.63	.16	.11	.0069	4.23	.03	.63
14,	.222	.052	4.29	.28	.15	.0129	4.68	.20	.15
15,	.041	.039	1.05	.06	.10	.0022	2.75	.39	.10
16,	.252	.092	2.74	.29	.31	.0137	3.98	.63	.11
17,	.077	.062	1.24	.08	.16	.0056	4.00	.13	.09
18,	.077	.053	1.45	.10	.16	.0058	4.46	.32	.23
19,	.135	.044	3.07	.19	.12	--------	--------	--------	--------
20,	.177	.067	2.63	.21	.16	.0095	3.87	.37	.30
21,	.097	.058	1.67	.14	.16	.0079	5.08	.22	.43
22,	.139	.081	1.72	.12	.20	.0130	5.91	.37	.46
23,	.066	.074	0.89	.09	.21	.0049	3.50	.38	.14
24,	.060	.050	1.20	.09	.12	.0038	3.36	.18	.25
25,	.061	.072	0.85	.08	.15	.0080	5.97	.08	.19
26,	.357	.060	5.95	.35	.13	.0065	1.56	.32	.21
27,	.077	.062	1.24	.11	.16	.0063	4.53	.20	.03
28,	.055	.030	1.83	.09	.10	.0056	6.65	.20	.22
29,	.122	.105	1.16	.17	.23	.0014	.53	.69	.34
30,	.084	.086	.98	.13	.15	.0049	3.60	.07	.27
31,	.120	.060	1.98	.17	.16	.0039	2.16	.05	.29
32,	.117	.047	2.48	.15	.13	.0043	2.61	--------	.20

DISCUSSION OF ANALYTICAL RESULTS

The percentages of solids range from 62.6 to 76.3%; only 14 samples meeting the national standard requirement of 68%; 12 other samples lie between 65 and 68%.

The polarization, after inversion, and at 20°C, are negative in all but two cases, No. 12 and No. 19, which contain glucose, although its presence is not declared on the corresponding labels.

The quantities of ash, in all cases but No. 2, No. 16, and No. 26, are so low as to indicate the use of either beet sugar, granulated cane sugar, or filtered sirup from raw cane sugar as the principal dissolved sugar in the preparations. In 18 cases, the total ash does not exceed .15%, i. e., one-third of the minimum for pure maple sirup.

The proportions of sulphuric acid in the ash is excessive in 24 cases out of 32, indicating that in these cases, at least, sugars other than granulated sugar have been employed. The high sulphuric acid content of glucose shows its influence in the case of No. 12.

Most important are the indications as to the maximum quantities of maple sirup that can be present in these mixtures called "Maple and Cane," more rarely, "Cane and Maple." Taking the *lowest proportions* of the several constituents in maple, rather than the corresponding *average* proportions, so as to magnify the quantities of maple, and, still further, neglecting all contributions to these constituents made by the added sugars, the following proportions of maple sugar in the mixture are indicated:

By the total ash, 1/9 to 10/11;
By the insoluble ash, $\frac{1}{8}$ to $\frac{2}{3}$;
By the alkalinity of the soluble ash, $\frac{1}{5}$ to all;
By the alkalinity of the insoluble ash, $\frac{1}{6}$ to all;
By the lead number. none to 7/12:
By the malic acid values, none to all.

Most significant of the probable maximums is the least proportion shown by any of these properties of the sirups. They show from *none* in the case of No. 3, up to $\frac{2}{5}$ in the case of No. 6, but, in 19 cases out of 32, show that the quantity of maple sirup present is, at the highest. not one-fourth of the total. In other words, most of these compound maple sirups are simply sirups made from other sugars and, at best. flavored with a little maple, if not with other imitation flavors of such nature as can not be detected by present analytical methods.

MISBRANDING OF COMPOUND MAPLE SIRUPS

Although the declarations on the labels of these sirups in most cases made clear their compound nature, there were a number of instances in which the labels did not conform strictly to legal requirements:

No. 12. The misleading statement, "Made of Pure Maple and Louisiana Cane Sugar" is made and the misleading device of a maple leaf and a bunch of sugar cane is used.

No. 19. Although the word "Compound" appears in large letters, the label does not contain "a statement of the substance entering into said compound," as the law requires.

No. 22. The word "Cane" was not printed in the manner prescribed by law.

No. 28. Label contains the rather misleading statement, "The adding of granulated sugar giving richness and body."

No. 29. The words "Log Cabin—Syrup," printed in white letters on red ground; the words "Cane Sugar and Maple Sugar," in small black caps on red ground, i. e., so as to be difficultly visible.

REFERENCES ON MAPLE SIRUPS

1. Garden and Forest, 4, 171.

2. C. H. Jones, A. W. Edson and W. J. Morse: The Maple Sap Flow Bull. No. 103, Vt. Agr. Exp. Sta., p. 45.

3. F. H. Storer: On the Results of a Search for other Sugars than Xylose and Dextrose in the Products of Hydrolysis of Wood from the Trunks of Trees. Bull. of the Bussey Institution, 2, p. 443-4 (1900).

4. Reference, 2.

5. F. H. Storer: Observations on Some of the Chemical Substances in the Trunks of Trees. Reference, 4, p. 389 (1897).

6. F. H. Storer: Testing for Mannose. Work cited in 5, 3, 34-35 (1902).

7. W. S. Clark: Reports 1873-4, Mass. Agr. College; Report 22 (1874), Mass. State Board of Agriculture.

8. Julius Schroeder: Versuchs-Stationnen, 14 (1871), 118 seq.

9. Wood: Bull. 24, New Hampshire College Agr. Exp. Sta. (1895).

10. W. Frear: Bulletin 5, Chem. Div., U. S. Dept. of Agr. (1885). Part IV, pp. 197-215.

11. Reference 2, p. 141.

12. Reference 2, p. 138.

13. W. H. Warren: Jour. Am. Chem. Soc., 33 (1911), 1205-1211; E. S. R., 25, 80.

14. A. W. Edson: Buddy Sap: Bull. 151, Vt. Agr. Exp. Sta.

15. Jones: Reference 2, p. 140.

16. W. W. Cooke and J. L. Hills: Maple Sugar: Bull. 26, Vt. Agr. Exp. Sta.

17. W. F. Hubbard: Maple Sugar and Sirup. Farmers' Bull. No. 252. U. S. Dept. of Agr., p. 33; also Cooke and Hills', Reference 16.

18. C. H. Jones: Maple Syrup and Maple Sugar Investigations. 18th Ann. Rep. (1905), Vt. Agr. Exp. Sta., pp. 335-6.

19. H. W. Wiley: Reference 11, p. 197.

20. Julius Hortvet: The Chemical Composition of Maple Syrup and Maple Sugar, Methods of Analysis, and Detection of Adulteration: Jour. Am. Chem. Soc., 26 (1904), p. 1530.

21. Secretary of Agriculture: Standards of Purity for Food Products: Cir. No. 19 (June 26, 1906), Office of the Secretary, U. S. Dept. of Agr., pp. 9 and 10.

22. A. McGill: A Study of Maple Syrup: Bull. No. 228, Laboratory of the Inland Revenue Dept., Canada, p. 3. For earlier studies of Maple Products, see Bulletins Nos. 102, 120, 140, 141, 155, 157, 214, and 215.

23. Reference No. 16, pp. 54-55.

24. Reference No. 17, p. 33.

25. J. L. Hills: Maple Sugar: Ann. Rep., 1891, Vt. Agr. Exp. Sta., pp. 160-162.

26. F. H. Storer: Notes on the Occurrence of Mannan in the Woods of some kinds of Trees, and in Various Roots and Fruits: Bull. Bussey Institution, 3, 68.

27. C. H. Jones: Detection of Adulteration in Maple Sugar and Syrup. 17th Ann. Rep. (1904), Vt. Agr. Exp. Sta., pp. 446-457; also work cited in No. 18, pp. 315-339.

28. Reference No. 20, pp. 1523-1545.

29. A. Hugh Bryan: Methods for the Analysis of Maple Products: Cir. No. 41, Bureau of Chemistry, U. S. Dept. of Agr., p. 10.

30. Reference No. 20, p. 1541.
31. Reference 9.

32. E. N. Eaton: Brochure on Experiments on Mixtures of Maple Sugar Syrup and Cane Sugar Syrup, Chicago, 1911.

33. Reference 29, p. 12.

34. Albert P. Sy: Three New Preliminary Tests for Maple Products: Jour. Am. Chem. Soc., 30 (1908), 1429-1431.

35. A. L. Winton and J. C. Kreider: A Method for the Determination of Lead Number in Maple Sirup and Maple Sugar: Jour. Am. Chem. Soc., 28 (1906), 1204-1209.

36. Reference 29, p. 5.

37. Reference 20, p. 1536.

38. A. E. Leach and H. C. Lythgoe: Cider Vinegar and Suggested Standards of Purity; Jour. Am. Chem. Soc., 26 (1904), 378-380.

39. Reference 29, p. 12.

40. Reference 27, p. 455.

SUGAR-CANE PRODUCTS

From the sugar-cane (*Saccharum officinarum,* Linn.) comes the greatest variety of saccharin food products: Cane-syrup, molasses, brown sugar, soft white sugars, part of our granulated sugars (of which a considerable fraction is derived from crude beet-sugar,) refinery sirup—which is, properly speaking, a molasses—rock candy, rock candy sirup and other sirups made by dissolving cane sugar of some degree of refinement.

The Sugar Cane

This plant is a member of the great Grass Family, and is, in reality, a tropical plant. It was, however, introduced into the Gulf States a century ago and has been the basis of an important series of related industries in this country. Despite its long period of acclimation in that semi-tropical portion of our land (it is grown as far north as the lower counties of South Carolina), it is still unable to produce seed, and is therefore grown from adventitious buds which develop from the internodes of the cane, when short lengths (rattoons) of the latter are planted in the furrow.

The sugar-cane is a crop of interest to our planters along the Gulf Coast from Southern Texas to South Carolina, but as well to the farmers of our dependencies, Porto Rico, Hawaii and the Philippine Islands.

Composition of Cane Juice

The sugar is usually obtained from the cane by crushing it and expressing its juice between huge rolls. The milling process has, of late years, been improved especially by sprinkling the bagasse, or once-milled, crushed cane, which retains, like a sponge, a considerable fraction of the original juice, and putting the bagasse a second time through the rolls to recover another important fraction of the sugar held by the wetted bagasse.

The average composition of the juice expressed from the Louisiana cane is stated by Browne:

TABLE XI

Composition of Cane Juice

	Per Cent.
Water,	85.00
Ash,	.40
Nitrogenous bodies,	.26
Sucrose,	12.00
Dextrose,	1.00
Levulose,	.70
Free acids,	.10

	Per Cent.
Combined acids,	.15
Pectin,	.10
Fat and wax,*	.10
Fiber particles,*	.12
Dirt and earthly matter,*	.06
Tannin, coloring matter,	.01
	100.00

*Mechanical impurities removed from the cane during milling.

This table shows that sugar cane juice is much richer in sugars than is maple sap. In individual cases, the percentage of sugars is much higher than the average here given.

It is noteworthy also that the cane sugar (sucrose) is here accompanied by dextrose and somewhat less levulose. When the cane is young, the latter sugars alone appear and in about equal proportions. Later, cane sugar is found, and as the season advances, the dextrose and levulose diminish as the cane sugar increases, the levulose decreasing more rapidly than the dextrose. When the cane attains full maturity, which it rarely does in the Gulf States, the levulose sometimes disappears altogether.

The nitrogenous bodies, here as in maple sap, form but a small part of the dissolved solids, although more abundant in the cane juice than in the maple sap. These nitrogenous bodies in cane juice are of great variety, as shown by the following analysis by Hardin, quoted by Browne:

Distribution of Nitrogen in Cane Juice

	Percentage in juice	Percentage of total nitrogen.
	%	%
Nitrogen in albumen,	.0039	9.47
Nitrogen in nuclein bodies,	.0025	6.32
Nitrogen in albuminoses,	.0021	5.26
Nitrogen in amido acids, (Aspartic),	.0122	30.53
Nitrogen in amido acid amids (Asparagin),	.0098	24.07
Nitrogen in ammonia,	.0024	6.18
Nitrogen in nitrates,	.0071	17.77
Nitrogen in nitrogenous bases,	---------	---------
Total,	0.0400	100.00

From the table first quoted it appears that cane juice contains also some gummy or pectinous matter. This has been found upon analysis to consist chiefly of three bodies, xylan, araban, and galactan.

Just as maple sap was found to contain an organic acid, malic acid, largely combined as the acid of malate of lime, so the cane juice too is found to contain organic acids, partly in a free state and partly in combination with mineral and possibly organic bases.

In the sugar cane, these acids are aspartic (also mentioned among the nitrogenous amido-acids), malic and succinic; while in the green cane, glycollic acid also appears. Furthermore, a small amount of a tannic acid is always present. Citric, tartaric, and aconitic acids have been reported as present in the cane, but these findings have not been confirmed.

Below is given an average of ash analyses made by Hall (quoted by Browne) of the juice of several varieties of cane:

Composition of Ash from Sugar Cane Juice

	Average
	%
Potash, K_2O,	45.54
Soda, Na_2O,	1.17
Lime, CaO,	3.93
Magnesia, MgO,	5.02
Iron Oxide, Fe_2O_3,	.95
Alumina, Al_2O_3,	.54
Silica, SiO_2,	6.56
Phosphoric acid, P_2O_5,	5.72
Sulphuric acid, SO_3,	21.78
Carbonic acid, CO_2,	3.55
Chlorine, Cl,	5.06
Total,	99.82
Deduct $O=Cl$,	1.17
	98.65
Carbon and undetermined,	1.85
	100.50

Alkalinity (cc N/10 per gm. ash) 29 cc.

It is understood, of course, that the proportions between the components, and as well also the total percentage of ash in the juice, will vary within rather wide limits according to the conditions of soil and fertilizer application.

Browne has noted, further, that the juices obtained from the second and third millings of the bagasse, even where no water is added to the latter, are much more impure than that obtained from the first pressing, since the ash, nitrogenous bodies and gums are much more abundant in the later pressings, although the dextrose and levulose show some decrease. The impurities (ash, etc) are also increased when the bagasse is moistened with water, and much more when it is moistened with steam, before the later millings.

The milling processes to which the cane is subjected in the sirup and sugar-making industries are very similar, but there is much difference in the succeeding steps of the manufacture of the two products, cane-sirup and cane-sugar. They will, therefore, be considered separately.

CANE-SIRUP MANUFACTURE

The object, in this branch of the industry, is the production of a sirup, of the finest, characteristic cane-flavor, of bright color and high transparency, and of the degree of concentration best suited, on the one hand, to the highest flavor and greatest resistance of the product to destructive fermentations, and, on the other, to the maintenance of the liquid state, since over-concentration induces a tendency of the sugar to crystallize and settle as a sediment to the bottom of the container,—a condition inconvenient alike to the dealer and consumer. Since, in this manufacture, the sugar of the juice is all to be retained, cane may be utilized which, owing to the high proportion of dextrose and levulose in its juice, substances that interfere with the crystallization of the cane sugar, would be of inferior value for sugar manufacture.[2]

In the manufacture of the sirup, therefore, the process is often so simple as to approach the character of the maple sirup manufacture. That is, heat alone is used to clarify the juice, that is, to rid it of mechanical impurities such as bits of fiber, cane wax, etc., and of a portion of the albuminoids and germs, which rise as a scum and are either skimmed or floated off from the heated juice. In the older practice, the juice was clarified and evaporated in an open kettle set directly over the fire, a practice still in vogue where the product is intended solely for domestic use. In more modern factories, however, steam coils are used for more safely heating the juice, and the clarification and evaporation are conducted in different vessels. Browne[3] presents some experiments by Agee and Hall, showing the efficiency of the method for removal of much of the albuminoids and gums, but notes that the boiling in the presence of organic acids of the juice results in the conversion of considerable amounts of the cane sugar into dextrose and levulose,— a change earlier stated not to be undesirable, if not carried too far, because of its rendering the sirup less likely to crystallize on keeping. Browne states, in the same connection, that in the manufacture of sirup, clarification by heat alone is often the sole method employed. Wiley —[4] notes of the manufacture by this method, that "the results have been highly satisfactory, and it can now be said, upon actual experimental data, that a table sirup can be made from the juice of sugar cane having an attractive light color and being practically free from suspended matter. In other words, the products are composed simply of the concentrated juice of the sugar cane, from which have been removed all the substances coagulated by heat during all of the processes of concentration. Such a product can be offered to the public with absolute certainty of its wholesomeness and freedom from all injurious substances."

In many factories, however, the process of clarification follows the plan commonly used in sugar factories; that is, the juice is clarified by the use of sulphurous acid either with or without partial neutralization by lime subsequently added, heat being applied, in either case, to complete the action. The result of this treatment, if it be properly controlled is, as Browne[5] has shown, the more complete removal of albuminoids and gums than can be effected by heat alone and a less inversion of cane sugar. The color of the sirup is kept light and bright, but the flavor and aroma are greatly impaired by the sulphurous taste and smell which remain in the product, to say nothing of the possible injury to health which these chemical residues may cause. When the evaporation is completed in open vessels, particularly by the old kettle method, the product is entitled to the established name, "open kettle sirup." The sirups evaporated, wholly or in part, in closed vessels under reduced pressure, should not bear this name.

In view of the character of the raw material and of the processes of manufacture of cane sirup, the following standard for cane sirup has been proclaimed by the Secretary of Agriculture[6] under authority of Congress:

> "Sugar-cane sirup is sirup made by the evaporation of the juice of the sugar-cane or by the solution of sugar-cane concrete, and contains not more than thirty (30) per cent. of water and not more than two and five-tenths (2.5) per cent. of ash."

The analytical data available from the analysis of authentic samples of cane sirup are not as numerous or complete as is desirable for the purposes of the food chemist in dealing with mixtures of cane-sirup with other similar materials.

Analysis made by the Department of Agriculture of sixty-nine cane sirups made in Georgia in 1903 and 1904, show the following average and range of percentages for the more commonly determined constituents:

Analyses of Georgia Cane-Sirups (Per Cent.)

	Moisture	Solids	Cane-sugar	Dextrose and levulose	Ash
Average,	24.16	75.84	48.67	20.88	.98
Highest,	21.50	78.50	63.70	48.08	1.61
Lowest,	31.13	68.87	25.30	6.70	.52

MOLASSES

Molasses (Cane-molasses) is the liquid residue obtained when the cane-sugar in clarified, concentrated, cane-juice is crystallized out and separated from the liquid. Beet molasses is the corresponding product from the sugar beet, but possesses such flavor and odor as to make it unpalatable for human consumption.

The molasses is the secondary product, the sugar being the more valuable substance. Since every accompanying substance dissolved in the cane juice, acts in greater or less degree to hold back from crystallization a portion of the cane-sugar, it is the sugar-maker's object to remove these substances as much as practicable before concentrating the juice to the point at which the sugar crystallizes out.

The composition of molasses varies both with that of the cane-juice from which it is derived, with the character of the processes used for sugar-making, and with the degree to which the cane-sugar is removed from the treated juice. The effects upon the molasses of the treatments adopted for purifying the juice, are regarded as of secondary importance.

A number of processes have been used, in addition to simple heating and removal of the scums thus brought to the top. Formerly lime alone was added to make the liquid alkaline; but this process has the disadvantage of causing not only a loss of sugar by inversion, but the formation of black, bitter, lime dextrosate and levulosate, which impair the quality of both the raw sugar and the molasses. In most sugar-factories, the sulphitation process is used, the sulphurous acid being introduced formerly as gas, more recently in the form of solid acid sulphite of lime.

An excess of sulphurous acid is thus introduced and the juice then brought back to weak acidity or to neutrality before heat is applied. The result is not only the removal of a large fraction of the impurities left behind, as scums and as filter-press cake upon the skimming of the hot juice and its subsequent filtration, but also the avoiding of losses by sugar inversion and the bleaching of the juice; so that filtration through bone-black, formerly used to decolorize the juice before concentration, is now usually omitted. The sulphurous acid exists in the juice partially free, partially combined; and part of it is volatilized in the later concentration of the juice and part oxidized to sulphuric acid, but some of it remains unchanged.

To avoid the effects of this undesirable residue, some manufacturers have tried the use of lime followed by concentrated phosphoric acid. The cost of the latter reagent has prevented its general use, and also the difficulties resulting from its separation as insoluble lime phosphate before the recovery of the sugar from the molasses has been carried to the usual degree of completion. Still another method, though not much used in cane-sugar manufacture, is what is known as the "carbonatation" method, in which, after the liming, carbonic acid gas is run through the liquor to take out the excess of lime. The result, however, is to increase the "gums" present in the clarified juice.

In the older methods of manufacture, the purified juice was concentrated in open-kettles, and when the mass had *grained,* owing to the crystallization of part of the sugar, the sugar was *cured,* or purified by draining and washing off the adherent molasses. Owing to the high concentration of the juice in the latter stages of this process, the boiling temperatures were high and resulted in the inversion of considerable sugar, and, through the effects of the invert sugar in preventing the crystallization of the cane-sugar, in an additional sugar loss for the latter reason.

The old fashioned "New Orleans" molasses, with its high content of cane-sugar, low ash, and distinctive flavor, was made chiefly in the manner just described.

Today, however, vacuum apparatus of various kinds is employed to make possible the concentration of the juice at low boiling temperatures with a consequent diminution of the sugar inversion. Moreover, the molasses is re-treated one or more times to recover, so far as practicable, the cane-sugar it retains after the first crystallization. The separation of the molasses is now effected in powerful centrifugals, in which the sugar crystals are washed. The sugar produced in the better equipped factories is not the dark brown Muscovado of half a century ago, but a soft, almost white product.

The molasses, on the other hand, consists more largely of invert sugar, and other impurities that escaped removal during the clarification, or were formed during the subsequent processes. Consequently the flavors and other properties are distinctly different from and inferior to those of the older cane molasses. The most impure molasses is gummy, bitter, dark colored and rich in ash, and is commonly known as "black strap." Its sugars fit it for use in the fermentation industries, and, with proper management, it is valuable as a cattle-food. Owing, however, to its high content in laxative salts and for other reasons, it is not a desirable table article.

Browne[7] gives the following analysis as representative of the various molasses produced by the modern methods, from a juice of average quality:

	First molasses	Second molasses	Third molasses
	%	%	%
Cane sugar,	53.60	41.70	31.70
Dextrose,	8.76	12.20	15.00
Levulose,	8.00	12.50	16.50
Albuminoids,	.20	.25	.33
Amids, etc.,	.94	1.50	2.00
Acids, gums, etc.,	4.50	6.50	8.20
Ash,	4.00	5.35	6.30
Total solids in product,	80.00	80.00	80.00

Wiley[8] published, in 1892, the results of a large number of analyses made under his direction by experienced analysts in different parts of the Union. From his data the writer has compiled the following summary:

Description	No. of sample	Moisture.	Solids	Sucrose	Reducing sugars	Ash	Undetermined
New Orleans molasses	110						
Average,		25.04	74.96	42.01	23.01	3.32	6.62
Highest,		35.50	83.30	66.00	41.0	8.90	24.23
Lowest,		16.70	64.50	16.40	19.6	.69	—8.10
Ib., samples taken in Louisiana:	26						
Average,		26.55	73.45	39.61	26.25	3.46	4.13
Highest,		31.20	77.10	56.8	37.8	6.28	8.04
Lowest,		22.90	68.80	28.9	17.0	.85	.37
"Open-kettle" New Orleans molasses:	10						
Average,		23.95	76.05	49.97	19.91	2.11	4.06
Highest,		28.69	82.83	59.07	28.98	3.15	
Lowest,		17.17	71.31	39.23	14.58	.85	
Porto Rico molasses:	10						
Average,		25.79	74.21	39.44	21.82	3.08	9.87
Highest,		29.85	78.72	50.08	30.00	5.33	
Lowest,		21.28	70.15	21.78	14.36	1.00	
Black strap molasses:	4						
Average,		22.80	77.20	27.02	29.96	5.11	12.11
Highest,		29.14	80.70	36.97	54.05	6.13	
Lowest,		19.30	70.86	7.92	17.21	4.36	

Analysis by Babington[9] of 31 samples of modern molasses, show the following range of composition:

	Per cent.
Cane sugar,	32—52
Reducing sugars,	13—24
Ash.	0.5— 4
Moisture,	29—32

The United States Standard[10] for molasses is:

> "*Molasses* is the product left after separating the sugar from masscuite, melada, mush sugar, or concrete, and contains not more than twenty-five (25) per cent. of water and not more than five (5) per cent. of ash."

Browne[7] observed that the molasses of lower Louisiana showed far more chlorides than those of the upper portions of the State, and observes that the former are, for that reason, less desirable for table use because of the influence of these salts upon the flavor.

It is further to be noted that molasses is a fermentable material. The fermentation usually begins at the surface, which is doubtless diluted by absorbing atmospheric moisture, but, ere long, it affects the entire mass. For this reason, modern molasses-packing establishments commonly sterilize the product and deliver it hot into the tin vessels commonly used as containers for the retail trade of today.

REFINED MOLASSES

The ordinary cane molasses possess little of the flavor and aroma characteristic of the fresh cane and of the old time open kettle sirup. The substances to which these characteristic qualities are due are apparently not destroyed, but simply "bound" chemically. The color of the molasses too is unattractive. This product is, therefore, sometimes subjected to so-called "refining processes," the products from which are termed "refined molasses." These processes are often quite crude. In one method, a suspension, in water, of acid sulphite of sodium is brought into contact with zinc dust, and, after these have reacted for a few moments, the resulting solution is strained through a cheese cloth and then mixed, by means of a stirring apparatus, with the crude molasses. A vigorous effervescence follows, with a bleaching of the molasses and a liberation of the characteristic cane aroma and flavor, although both are obscured by the accompanying effects of free sulphrous acid. In some cases there follows a treatment with oxalic acid.[11] Whichever of these courses is pursued, there is danger that the resulting "refined" molasses may contain small amounts of a poisonous substance, zinc salts or oxalic acid salts.

In other cases, the refining consists simply in a removal of part of the color by filtration through bone-char, or in a bleaching by aid of ozone, hydrogen peroxide, sulphurous acid, sulphuric acid, or chloride of tin.

The common forms of adulteration of these products other than by the introduction, in the course of treatment, of injurious substances, such as zinc, tin, and sometimes copper, (and very serious consideration must be given in this connection to the residual sulphurous acid), is by the substitution of glucose for a part of the sugar cane product. Misbranding also is not unknown, such as the designation as "open kettle," of products obtained by other processes. Concerning the signification of the qualification "New Orleans" used in conjunction with the word "molasses," the Board of Food and Drug Inspection of the U. S. Bureau of Chemistry, by the vote of two of its three members, decided that its original signification of open kettle drippings or "bleedings" has disappeared, but that it should be restricted to molasses produced in Louisiana.[12]

MOLASSES SAMPLES ANALYZED

The following samples, classified according as they bore the names, cane sirup, molasses, New Orleans molasses, and refined molasses, respectively, were submitted by the special agents of the Bureau:

Group No.	Agent's No.	
		Sugar Cane Sirup.
1.	3241	E. C. Joullian Canning Co., St. Bernard Parish, La. St. Bernard Brand Sugar Cane Syrup. Bought of Gimbel Bros., Philadelphia, Pa. Price, 20 c.
		Molasses.
1,	3128	P. Duff & Sons, Pittsburg, Pa. Palmetto Brand Molasses for Baking and Table Use. Contains Sulphur Dioxide. Bought of D. Pollock, Harrisburg, Pa.
2.	3225	P. Duff & Sons, Pittsburg, Pa., Red Lion Style Louisiana Baking Molasses. Contains Sulphur Dioxide. Known for its baking qualities and rich cherry color. Bought of Blase Bros., Erie, Pa.
3.	3215	P. Duff & Sons, Pittsburg, Pa. St Catharine Brand Molasses. For Baking. Contains Sulphur Dioxide. Bought from C. W. Hicks, Williamsport, Pa.
4.	3233	Hearn & Jones, New Orleans, La. Rockwood Pure Molasses.* Contains Sulphur Dioxide. Bought of Mr. Dwyer, Pittsburg, Pa.
5.	3232	Hearn & Jones, New Orleans, La. Woman's Club Brand Pure Molasses.* Contains Sulphur Dioxide. Bought of Kauffmann's, Pittsburg, Pa.
6.	3219	Penick & Ford, Ltd., New Orleans and Shreveport, La. Orla Brand Old Fashion Type Molasses.* Contains Sulphur Dioxide. Absolutely pure as it comes from the plantation. Bought of D. F. Detrick, Williamsport, Pa.
7.	3264	S. Scheiver & Bro., Paterson, N. J. Premium Molasses. Contains Sulphur Dioxide. Stick label: Preserved by use of one-tenth of 1 per cent. Benzoate of Soda. Bought of S. Schuyler, Easton, Pa.
8.	3258	R. C. Williams & Co., Distributors, New York. Coronet Brand Molasses.* Absolutely Pure and Especially Prepared for Table and Baking Purposes. Contains Sulphur Dioxide. Bought of Mohican Co., S. Front St., Easton, Pa.

Group No.	Agent's No.	
		New Orleans Molasses.
1.	3227	N. H. Alexander Co., Cincinnati, O. Cherry Grove Pure Cane Dark Red New Orleans Molasses. Warranted Pure and Wholesome. Contains Sulphur Dioxide. Bought of Mrs. Drauz, Erie, Pa.
2.	3224	N. H. Alexander Co., Cincinnati, O. Robin Red Breast Brand Pure Red New Orleans Molasses, Pure and Wholesome. Contains Sulphur Dioxide. For Baking and Table Use. Bought of Jno. Scarlett Co., Erie, Pa.
3.	3231	N. H. Alexander Co., Cincinnati, O. Tiger Brand Pure New Orleans Molasses. None Better for Any Purpose. Contains Sulphur Dioxide. Choice light color. Bought of Kauffmann's, Pittsburg, Pa.
4.	3252	Central Molasses and Syrup Refinery, Philadelphia, Pa. Dunlap's Best "Violet Brand" New Orleans Molasses. Contains Sulphur Dioxide. Bought of G. M. Dunlap Co., Chester, Pa.
5.	3251	Central Molasses and Syrup Refinery, Philadelphia, Pa. Dunlap's 10 c. New Orleans Molasses. For Baking and General Use. Packed for Geo. M. Dunlap Co. Contains Sulphur Dioxide. Bought of Geo. M. Dunlap, Chester, Pa.
6.	3220	Clark, Chapin & Bushnell, New York. Orange Grove Pure New Orleans Molasses. Warranted Pure and Wholesome. Contains Sulphur Dioxide. Bought of D. F. Dietrick, Williamsport, Pa.
7.	3146	P. Duff & Sons, Pittsburg, Pa. Duff's New Orleans Molasses (No. 2 1/3). A High Grade Product to which we have added Louisiana Sugar, which increases its sweetness and value. Contains Sulphur Dioxide. Device, Ginger Bread Man. Bought of Jonas Long's Sons, Scranton, Pa.
8.	3154	Hearn & Jones, New Orleans, La., Distributors. Old Mill Brand Pure New Orleans Molasses.* Contains Sulphur Dioxide. Bought of Childs Grocery Co., Lancaster, Pa.
9.	3250	Hearn & Jones, New Orleans, La. Pure New Orleans Molasses, Sunflower Brand.* Always Uniform, of Special Fine Flavor. Selected (for) Table and Baking Quality. Contains Sulphur Dioxide. Bought of Columbian Tea House, Chester, Pa.
10.	3238	James W. Houston Co., Pittsburg, Pa. Willard Brand New Orleans Molasses. For the Best Family Trade. Excellent for Baking. Contains Sulphur Dioxide. Bought of Chas. Bergman, Pittsburg,, Pa.
11.	3191	Penick & Ford, Ltd., New Orleans and Shreveport, La. Aunt Dinah Brand Pure New Orleans Molasses.* Bought of N. A. Flickinger, Reading, Pa.
12.	3150	Penick & Ford, Ltd., New Orleans and Shreveport, La. Brer Rabbit Brand Pure New Orleans Molasses.* This Molasses is Selected for its Exceptional Baking Qualities. Contains Sulphur Dioxide. Bought of Mohican Co., Wilkes-Barre, Pa.
13.	3218	Steuart, Knatz & Co., Baltimore, Md. Old Time New Orleans Molasses. For Table and Baking. Crown Brand. Quality Guaranteed. Contains Sulphur Dioxide. Bought of Z. Gray & Co., now J. H. Bertin & Co., Williamsport, Pa.
14.	3211	Steuart, Knatz & Co., Baltimore, Md. Winter Queen New Orleans Molasses.* Especially Prepared for Baking Purposes and Less is Required than Ordinary Molasses. Contains Sulphur Dioxide. Bought of W. A. Hartman, Sunbury, Pa.
		Refined Molasses.
1.	3226	P. Duff & Sons, Pittsburg, Pa. The Only Molasses Refiners. Duff's Refined Molasses. The Best for Every Purpose. Flavor, Baking, Strength, Sweetness, Cheapest. Guaranteed the richest and finest flavored for table use. Made from high grade New Orleans Molasses, with all dirt, chemical and vegetable impurities removed. Bought of Mrs. Drauz, Erie, Pa.

ANALYTICAL EXAMINATION.

The following determinations were made on these samples:

Physical:

a. Refractive index (28° C.)
b. Specific gravity.
c. Polarization, direct (20° C.)
d. Polarization, indirect, (20° and 87° C.)

Chemical:

e. Reducing sugars.
f. Ash, total.
g. Ash, water soluble.
h. Ash, water insoluble.
i. Alkalinity of soluble ash, (from 1 gram of sample).
j. Alkalinity of insoluble ash, (from b gram of sample.)
k. Sulphuric acid (SO_3).
I. Sulphurous acid (Steam distillation).
m. Zinc.
n. Tin.
o. Benzoic and salicylic acid, and saccharin.

These determinations were made according to the official methods, except those of tin and zinc.*

The results of these determinations are given in the following tables:

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*Determination of Tin and Zinc: The method used was as follows: 50 grams of the molasses was ignited to a gray ash in a porcelain dish with 15 cc. concentrated sulphuric acid. The ash was then dissolved by boiling for 30 minutes with concentrated hydrochloric acid, the solution diluted with water, filtered, the residue on the filter well washed. The united filtrate and washings were nearly neutralized with ammonia water, hydrogen sulphid passed through the liquid, and the latter allowed to stand in a warm place over night. The precipitated sulphids were filtered, and washed on the filter; after which, the tin and zinc sulphids were dissolved out by passing boiling ammonium sulphid through the filter. In a few cases, marked * in the table, a little black, lead sulphid was left undissolved. The tin sulphid was separated by acidulating the filtrate, the precipitate filtered off, washed, ignited and weighed as tin oxid (SnO_2).

The filtrate and washings from the tin sulphid were treated at boiling heat with bromin to oxidize ferous salts, the excess of bromin boiled off, ferric chlorid added until a yellow color appeared, the liquid nearly neutralized with ammonia water, a little acetic acid added, and the liquid boiled. The zinc sulphid, thereupon separated, was filtered off, washed, ignited and weighed as zinc oxid (ZnO).

SUGAR-CANE PRODUCTS

I. Physical and General Chemical Characters

Group. No.	Agent's No.	Sp. gr. (60° F)	Refractive index (28° C)	Polarization (V°)			Moisture	Solids (Geerlig)	Cane sugar (Clerget)	Reducing sugars	Ash	Undetermined
				Direct (20° C)	Indirect (20° C)	(87° C)						
							%	%	%	%	%	%
Sugar-cane Syrup,	3241	1.411	1.4858	+51.4	—20.0	+0.9	29.00	71.00	56.08	8.72	1.91	3.29
Molasses (Other than New Orleans)—												
1,	3128	1.389	1.4734	+41.4	—18.48	+0.9	26.15	73.85	47.85	23.08	5.00	.37
2,	3225	1.357	1.4763	+31.6	—11.90	+3.5	25.35	74.65	32.79	15.28	7.51	19.07
3,	3215	1.390	1.4754	+24.4	—14.1	0.0	24.95	75.05	29.02	12.42	7.58	26.03
4,	3233	1.406	1.4777	+30.0	—16.7	0.0	24.60	75.40	35.22	22.06	5.30	12.82
5,	3232	1.391	1.4768	+37.6	—20.0	+1.3	24.75	75.25	43.42	22.30	3.44	6.09
6,	3219	1.387	1.4936	+40.4	—17.6	0.0	18.20	81.80	43.72	16.12	3.44	18.52
7,	3264	1.408	1.4766	+33.6	—17.6	+13.2	24.80	75.20	38.60	22.20	4.99	9.44
8,	3258	1.425	1.4803	+30.0	—17.2	0.0	23.35	76.65	35.60	22.34	5.77	12.94
New Orleans Molasses—												
1,	3227	1.410	1.4881	+22.02	—16.7	0.0	23.00	77.00	29.17	15.42	7.60	14.81
2,	3224	1.365	1.4793	+18.0	—16.7	+8.8*	23.75	76.25	26.16	22.94	6.53	20.62
3,	3231	1.403	1.4746	+36.8	—17.2	+4.4	25.65	74.35	40.71	20.61	4.94	8.09
4,	3252	1.417	1.4853	+43.6	—18.0	0.0	21.35	78.65	46.43	15.14	4.84	12.24
5,	3251	1.406	1.4786	+26.0	—13.6	+3.5	24.00	76.00	29.85	24.22	5.84	16.00
6,	3220	Fermented	1.4802	+13.2	—18.0	+5.0	23.40	76.60	23.52	28.78	5.78	18.52
7,	3146	1.405	1.4783	+36.4	—16.3	+1.3	24.20	75.80	39.73	20.52	4.24	11.31
8,	3154	1.350	1.4784	+28.4	—12.32	+2.2*	24.15	75.85	30.70	21.76	4.74	18.65
9,	3250	1.395	1.4735	+25.2	—12.8	—2.2	26.05	73.95	28.65	19.22	4.95	21.13
10.	3238	1.400	1.4755	+27.2	—17.6	+2.6	25.30	74.70	33.77	25.74	4.72	10.47
11,	3191	Fermented	1.4813	+27.2	—17.6	—4.4*	22.95	77.05	33.77	20.42	4.46	18.40
12,	3150	1.409	1.4793	+27.6	—17.2	+3.0*	23.75	76.25	33.77	21.22	4.77	18.49
13,	3218	1.393	1.4781	+42.0	—18.5	+1.3	24.25	75.75	45.62	14.46	3.95	11.72
14,	3211	1.456	1.4894	+26.8	—18.0	+0.9	19.80	80.20	33.77	27.08	6.00	13.35
Refined Molasses—												
1,	3226	1.357	1.4796	+40.8	—17.6	+0.88	23.65	76.35	44.02	17.56	4.29	10.48

*Readings approximate because of high color.

SUGAR-CANE PRODUCTS

II. Special Chemical Characters

Group Number.	Agent's number.	Soluble ash.	Insoluble ash.	Alkalinity.		Sulphuric acid (SO₃) in molasses.	Sulphurous acid (SO₂) in molasses.	Zinc in molasses.	Tin in molasses.
				Soluble ash.	Insoluble ash.				
Sugar-cane Syrup.									
		%	%	Cc.	Cc.	%	P.p. Mill.	P.p. Mill.	P.p. Mill.
1,	3241	1.540	0.370	1.58	0.92	1.372	32	Trace.	18.9
Molasses (other than New Orleans).									
1,	3128	4.056	0.945	2.77	2.12	.5109	32	None.	23.6
2,	3225	6.335	1.175	4.38	3.26	.2352	50	32.1	23.6
3,	3215	5.220	2.360	2.88	5.22	.49049	35	14.5	39.4
4,	3233	4.160	1.140	3.42	2.54	.5365	70	†	28.4
5,	3232	2.764	0.680	2.14	1.40	.3615	32	Trace.	44.1
6,	3219	2.700	0.740	2.12	1.60	.3162	92	9.6	14.2
7,	3264	3.836	1.150	2.70	2.66	.4411	188	20.9	28.4
8,	3258	4.750	1.020	1.64	2.42	.4596	80	35.3	11.0
New Orleans Molasses.									
1,	3227	5.768	1.832	2.86	4.48	.7210	51	†	42.6
2,	3224	5.280	1.400	3.73	3.12	.3189	64	9.6	17.3
3,	3231	3.410	1.530	2.32	3.66	.4960	902	12.8	*37.9
4,	3252	3.926	0.914	4.08	2.26	.4390	80	†	†
5,	3251	4.460	1.380	0.80	3.54	.3670	32	†	†
6,	3220	4.530	1.255	2.74	2,92	.5683	61	Trace.	17.3
7,	3146	3.490	0.750	1.97	1.67	.3474	112	45.0	25.2
8,	3154	3.660	1.082	3.07	2.48	.4054	80	None.	None.
9,	3250	4.274	0.676	1.90	1.74	.3211	54	25.7	26.8
10,	3238	3.550	1.170	3.12	2.38	.4610	86	17.7	15.8
11,	3191	3.255	1.205	1.93	3.03	.5086	49	16.1	22.1
12,	3150	3.860	0.910	3.11	2.12	.4476	0	22.5	28.4
13,	3218	3.230	0.720	2.88	1.44	.2916	45	14.5	*22.1
14,	3211	4.422	1.530	2.88	3.36	.6380	57	None.	None.
Refined Molasses.									
1,	3226	3.532	0.760	2.57	1.67	.5230	45	19.3	29.9

†Not determined.
*Contained some lead.

Discussion of Analytical Results

The sugar cane sirup, No. 3241, corresponds well in the general composition of its solids, with average cane sirup. Its concentration, however, is too low.

The molasses samples show, in general, a good measure of conformity to the national standard for solids; only two samples, out of the 22 examined, show a deficiency of more than 1% from this standard.

As respects their ash content, however, the conditions are not so good; 11 samples, or one-half of the total number examined, having ash more than one-half per cent. in excess of the standard maximum.

This character points to a lower grade in the quality of these products than is desirable for table or cooking purposes. It is interesting, in this connection, to observe that the food standards proclaimed by the Louisiana State Board of Health[13] follow quite generally the national standards, but increase the ash maximum for molasses from 5 to 10 per cent.; and for cane sirup, from 2.5 to 4.2 per cent.; while for the molasses, the water maximum is increased from 25 to 30 per cent.

Three other qualities of these samples point in the same direction: The deep black color many of them show, the high proportion of reducing sugars to the cane sugar (sucrose) present, and the large proportion of undetermined matters. The evidence furnished by the analyses with respect to these four characters, points to the sale for human consumption, of a large quantity of "black strap" unsuited for such use.

It is only fair, in this connection, to note the serious difficulties encountered in making accurate analyses of molasses, which, by reason of their sticky, viscous condition, are not readily weighed out, dissolved, and filtered, and because of the dark color of their solutions, are very hard to polarize with exactness. The general tendency is probably to read the polarizations too low, and thus to understate in the analysis the percentage of cane sugar present, and to overstate the "undetermined matters."

The polarizations at 87°C, after inversion of the molasses solutions, exhibit a general tendency toward dextro-rotation, instead of the neutrality which theoretically should appear. The degree of dextro-rotation, in those cases not marked* because of the very dark color of the solution, is, however, too small to suggest any cause other than a partial destruction of the levulose by the heating method employed.

In other words, these samples do not exhibit the prevalent adulteration with glucose that appeared, thirty years ago, at the time of Wiley's[8] investigation of the molasses on the retail market.

The tabulated analyses justify somewhat more extended discussion at certain points:

Ash: The *quantity* of ash in the 22 samples of molasses (group 2 and 3) range from 3.44 to 7.60 per cent., and average 5.29 per cent.

The quality of the ash varies not only with that of the plant as influenced by soil and fertilizer treatment, but also with the manufacturing operations.

The samples show wide differences at a number of points. For example, the *solubility* of the ash in hot water: The average percentage of water-soluble ash was 4.129 per cent., equivalent to 78 per cent. of the total ash; but the proportion of the ash that is water soluble varies, in the different samples, from 68 to 85 per cent. Comparison with the proportions in this respect exhibited by samples of known history, is impossible because few figures are available in the literature on the subject.

Again, taking the percentage of sulphuric acid (SO_3) in the ash into consideration, it is clear that the amount of sulphuring and the degree to which the injected sulphurous acid is oxidized to sulphuric acid, must affect the proportion of this constituent appearing in the ash. Browne[14] states that in the ash of typical molasses made by mill sulphitation, the usual method, he found 10.79 per cent. of SO_3; in that from diffusion sulphitation 6.72 per cent; from the open kettle process, 10.94 per cent.; and rather curiously, from carbonatation, 11.18 per cent. In the commercial samples we examined, the quantity of SO_3 in the ash, stated in terms of the entire molasses, ranged from .2352 per cent. to .7210 per cent., average, .4401 per cent. In terms of the ash itself, the quantities ranged from 3.13 to 11.42 per cent., average 8.50 per cent of the total ash. The low percentages in samples 3225 (3.13%) and 3224 (4.88%) are the only notable figures in the list.

Sulphurous acid: The reasons for the presence of this chemical reagent have already been set forth. It is clear that this constituent is not used by molasses makers for the preservation of their product, but that it has been in use for many years primarily as a clarifying agent, secondarily as a decolorizer. The researches of the Louisiana Sugar Experiment Station[15] failed to show any *free* sulphurous acid in Louisiana molasses. It is well known that this acid has a very marked tendency to unite with some saccharin substances to form compounds that do not liberate their sulphurous acid content when brought into contact with weak organic acids, but they do slowly and continuously liberate their sulphurous acid even at ordinary temperatures in contact with dilute mineral acid, such as the hydrochloric acid of the gastric juice.

The quantities appearing in these samples range from none to 902 parts per million of molasses; average, 102 parts per million.

The Food Act of May 13, 1910, provides, "That in the preparation of dried fruits and molasses, sulphur dioxide, either free or in simple combination, may be used in such quantities as will not render said dried fruits or molasses deleterious to health." The danger point is not specifically indicated. Wiley,[16] after an experiment of twenty days, during which sulphurous acid was fed in the form of sodium sulphite and of a water solution of gaseous sulphurous acid, in amount ranging from .078 to 1.020 grams each day for each subject, concluded that in these quantities the sulphurous acid is decidedly injurious to health; on the other hand, Blouin and his associates,[15] in experiments in which from .084 to 0.299 grams of sulphurous acid were administered daily in molasses and cane sirup to healthy negroes, found no indications of injury to health at certain of the points where injurious effects were indicated by Wiley's experiments. The sirup and molasses used by the Louisiana experimenters contained, according to their report, sulphurous acid as follows, in parts per million of the sirup, etc.: Sirup, 910, open kettle molasses, 1st sample, 322; 2nd sample, 1004; vacuum process molasses, 1856*.

However satisfactory to manufacturers these conclusions from the Louisiana experiments may be, consumers will welcome the day when the present sulphitation process is replaced by some other method, practicable to the sugar-maker and beyond objection by the consumer.

Zinc: Of the 18 molasses samples examined for this poisonous metal, all but 4 were found to contain it in amounts varying from mere traces to 45 parts per million of molasses, average, 15.3 parts. It is not clear how these quantities of zinc find their way into the molasses. Gladstone[17] found that zinc, like copper, is but slightly attacked by sugars; although, as Salkowski[18] and Fileti[19] found that dextrose attacks copper oxid, it may be that zinc oxid also would yield to the action of invert sugar. As a matter of fact, however, galvanized vessels are little, if at all, in use in the sugar-house. A more probable source of this impurity is the zinc chlorid commonly used as a flux for the soldering of the tin cans in which the molasses is commonly put up for the retail market. Unless the cans are thoroughly washed before they are filled, zinc would be thus introduced, where zinc chlorid is used in place of rosin, for a flux.[20]

Tin: Of the 20 samples examined for this poisonous metal, all but two were found to contain it in quantities ranging from 11.0 to 42.6 parts per million, and, in several cases, it was accompanied by a little lead. The average quantity found was 23.4 parts per million.

In this case, it seems improbable that the tin was introduced in the course of manufacture, since the use of tin salts to impart a yellow color to certain grades of sugar, is probably not practiced in Louisiana at the present time. Molasses is, however, a distinctly acid product and may, by the action of its acids, dissolve some of the tin from the inside walls of the tin containers commonly used. It should be said, however, that the walls of the cans showed, at the time when the containers were opened and the portions of samples taken for analysis, no strong evidence of such attack.

Of the two metals together, the samples examined for both contained from 23.6 to 70.2 parts per million. Weber[21] found from a trace to 640 parts per million in 16 samples, average 132 parts. The quantities we have found are, therefore, well within the range of experience.

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*These figures are obtained by multiplying by 2 the original results, which are expressed in terms of sulphur, not sulphurous acid.

It is deserving of mention that the Louisiana food regulations specifically bar the sale of sirups and molasses containing these metals.

Refined molasses: Of these products but one sample was submitted for analysis. The method used in refining is unknown. Neither in its general composition nor in its special chemical characters, does it fall outside the range of ordinary molasses.

Misbranding

The Food Act of May 13, 1909, in addition to its prohibition of deceptive labelling specifically provides that "when————any quantity of sulphur dioxide is used in the preparation of————molasses, the fact that ———— sulphur dioxide has been used in the preparation thereof shall be plainly stated on the label."

The legal tolerance for sulphurous acid does not extend to any sugar product except molasses.

The labels, in all but two cases, contain a declaration of the presence of sulphur dioxide, usually in type as *large* as the law specifies; but usually the declaration fails to be made *plain* to the purchaser. For example, attention is called to the place and manner of declaration in some of the cases:

3219: Obscure, against a dark background.
3225: Very obscure.
3258: In black letters on red ground.
3233: Small letters on side label.
3146: In fine type on edge of label; also 3231 and 3238.
3211: On side label, at bottom.
3224: In faint color.
3251: In very small letters.

It is impossible, with the present analytical data at least, to determine the truth of the label statements concerning the places of production of these products. The analyses indicate clearly, however, that the seller's enthusiasm (?) rather than the real qualities of the commodities account for a large fraction of the superlatives used on these labels.

Sugar Refining Products and Sugar Sirups

The raw sugars formerly made carried upon their surfaces considerable quantities of molasses not removable by the curing processes then practiced. Today, however, the molasses is much more perfectly removed. Browne[22] says, "In Louisiana a very pure white sugar is made by spraying with several sprinklings of water (in the centrifugal); such sugar is over 99 per cent. pure sucrose, the remainder being mostly moisture. In Cuba and Porto Rico they aim to make a 96 per cent. sugar. In Hawaii and Java, a sugar testing 97 per cent. is desired."

The raw sugars are put through careful refining processes in order to obtain the hard-grained, white, granulated, loaf, and flour sugars. The process is briefly as follows: The raw sugar is dissolved by water and steam, the solutions strained, then defecated, not by lime as in the case of the cane juice, but by beef's blood, with or without bone black. The albumen of the blood is coagulated by heat, like white of egg when used to clear coffee, and gathers into its mass the fine suspended impurities of the sugar solution. If the molasses is very acid, lime sufficient to neutralize it may be used, and later removed by phosphoric acid, the phosphate of lime assisting in the clarification. The liquid is then run off through thick cotton filters, through which it passes as a brown to brownish liquor, which is then re-filtered through bone black to decolorize it. The first portions of liquid coming through the filter are white; the latter portions, however, still retain a little color and are run to a separate tank, from which they are drawn to make "soft" sugar, while the colorless solution is used for the finest sugars. The concentration of the decolorized sirup follows, vacuum apparatus being exclusively used, and the method of conducting the operation determining the production of "hard" or of "soft" sugar. After crystallization is completed, the refiner's molasses is removed by the use of centrifugals of one form or another.

The amount of impurity in these molasses differs, of course, with the quality of the raw sugar used and with the completeness of the purification which its solution has undergone in the refining processes. Different trade names are applied to these products:

"*Green sirup* is the sirup centrifugated from the second products in the refining process."

"*Golden sirup* is produced from a refiner's molasses by diluting, filtering through bone black and then concentrating."

"*Treacle* is a name formerly given to the drainings from the dark molasses sugars called *bastards*."[23]

The sirupy liquors obtained in the last stages of the refining of beet sugars are also used for table sirups, the crystallization of the cane sugar being prevented by its partial inversion.[24]

In addition to these secondary products of the sugar refinery, there are other products, more properly *sirups*, made by the solution of sugars, and also the mother liquor left from the manufacture of rock candy and known as "rock candy sirup." The proportions of impurities in these products vary with the material used in their preparation.

The general nature of the principal classes of this group is show by the following summary:

	Water	Sucrose	Glucose	Ash	Organic impurities	Analyst
Green syrup,	27.7	62.7	8.0	1.0	0.6	Wallace[2
Golden syrup,	22.7	39.6	33.0	2.5	2.8	Wallace[2
Golden drips,	19.98	42.76	26.41	4.51	6.34	Wiley
Treacle,	23.4	32.5	37.2	3.5	3.5	Wallace[2
Rock-candy syrup,	28.56	53.94	9.20	.35	7.93	Wiley

The national standards for refinery molasses or sirup and suga sirup[26] are:

"*Refiner's sirup, treacle*, is the residual liquid product obtained in the process of refining raw sugars and contains not more than twenty-five (25) per cent. of wate and not more than eight (8) per cent. of ash."

"*Sugar sirup* is the product made by dissolving sugar to the consistence of a sirup and contains not more than thirty-five (35) per cent. of water."

The samples belonging to this group of products submitted by the sampling agent were:

REFINER'S MOLASSES AND SUGAR SIRUP ANALYZED

The following samples, including some that are apparently imitations of maple sirup, though not sold under indicative names, were sumbitted by official agents.

Group No.	Sample No.	
1.	3249	E. Bradford Clarke Co., Ltd., 1520 Chestnut St., Philadelphia, Pa. Pure and Unadulterated Rock Candy Syrup. Bought of E. Bradford Clarke Co.
2.	3244	Finley Acker Co., Philadelphia, Pa. Acker's "H. G." Golden Cane Syrup. Bought of Finley Acker Co., Philadelphia.
3.	3129	Abram Lyle & Son, Lyle's Golden Syrup.* Warranted free from Starch Glucose.
4.	3248	Wm. Montgomery & Co., Philadelphia, Maple Leaf Brand. Extra Fancy Pure Sugar Syrup. Guaranteed Absolutely Pure. Bought of John S. Marks, Philadelphia.
5.	3187	Most Co., Inc., Pittsburg, Pa. Old Hickory Syrup.* Colored with Caramel and Flavored. Bought of A. S. Deiter, Reading, Pa.
6.	3242	Perfection Java Closure Co., Philadelphia, Pa. Perjanva Pure Golden Syrup. Made from Refiner's Syrup and Sugar. Highest quality of richness, flavor and purity and contains no corn glucose. It conforms to Pure Food requirements. Bought of Gimbel Bros., Philadelphia.
7.	3210	Rigney & Co., Brooklyn, N. Y. "Brand." Rock Candy Syrup.* Bought of W. A. Hartman, Sunbury, Pa.
8.	3223	A. E. Ritty Canning Co., Dayton, O. Ohio Syrup.* Pure and Deliciously Flavored. Bought of Geo. D. Williams, Erie, Pa.
9.	3132	J. Stromeyer & Co., Philadelphia, Pa. The Stromeyer Penn Mar Brands of Fancy Table Syrup. The Syrup is Warranted Pure, Wholesome and Delicious. Manufactured from Select Cane Sugar. Bought of Kreidler Bros., Harrisburg, Pa. Price, 20 c.

The analytical methods employed in these cases were in part like those used for maple sirups, in part like those used for cane sirups, according to the similarities they exhibited in physical properties.

The analytical results were as follows:

REFINER'S MOLASSES, SUGAR SIRUPS, ETC.

Group Number	1	2	3	4	5	6	7	8	9
Agent's number,	3249	3244	3129	3248	3187	3242	3210	3223	3132
Specific gravity,	1.317	1.406	1.436	1.425	1.334	1.428	1.341	1.327	1.411
Refractive index (28°C.),	1.4583	1.4862	1.4904	1.4873	1.4598	1.4848	1.4596	1.4574	1.4868
Polarization:									
Direct (20 C.),	56.4	22.6	20.8	39.4	57.1	23.0	54.0	62.8	26.6
Indirect (20 C.),	—22.44	—19.8	—23.8	—10.2	—21.67	—18.0	—23.2	—20.46	—22.44
Indirect (87 C.),	4.62	4.84	4.0	2.6	0.23	5.3	1.54	0.66	1.76
Moisture (per cent.),	32.30	21.00	19.40	20.60	31.70	21.55	31.80	32.70	21.20
Solids (per cent.),	67.70	79.00	80.60	79.40	68.30	78.45	68.20	67.30	79.20
Sucrose (per cent.),	60.03	31.96	33.62	37.33	59.53	30.91	58.34	62.76	36.96
Invert sugars (per cent.),	3.71	39.02	40.66	25.24	5.79	40.40	2.07	.47	38.14
Ash (per cent),	0.010	.73	1.83	4.98	.024	2.52	.005	.064	.811
Undetermined (per cent.),	3.95	7.29	4.59	11.85	2.956	4.62	7.785	4.006	3.289
Special Properties:									
Ash, soluble (per cent.),	.010	.650	1.74	4.13	.021	2.32	.003	.019	.745
Ash, insoluble (per cent.),	None.	.080	.09	.85	.003	.20	.002	.041	.066
Ash alkalinity:									
Soluble (Cc.),	.03	.54		1.55	.03	1.14	.02	.035	.53
Insoluble (Cc.),		.30		3.20	.025	.64	.00	.100	.21
Total (Cc.),	.03	.84		4.75	.055	1.74	.02	.135	.74
Ash ratio:									
Soluble,									
Insoluble,		8.1	19.3	4.9	7.0	11.6	1.5	.46	11.3
Lead number,	.06				.15		.38	.0	
Malic acid value,	None.			.16	.14		.17	.13	
SO_3 in ash per cent. (syrup),	.0034	.0940	.3361	.1000	.0037	.1399	None.	.0044	.0528
SO_2 in syrup (P.p.m.),		3.0	3.0			None.			None.
SnO_2 in syrup (P.p.m.),									23.6
ZnO in syrup (P.p.m.),									24.1

Discussion of Analytical Results

None of these products responded to tests for benzoic and salicylic acids, nor for saccharin.

As respects solids, all met standard requirements within practical limits.

The golden sirups, 3244, 3129 and 3242, all show high percentages of invert sugar and less sucrose than the average amount found by Wallace in such sirups. The ashes in these sirups range from .73 to 2.52 per cent., smaller percentages than would be expected from the last of sweet water from the charcoal filter. These may be accounted for, in case of 3242 and possibly in other cases, by the adding of sugar solution to the refinery molasses; though the large proportion of invert sugar indicates that either the proportion of added sugar is small, or that it was inverted as part of the manufacturing process. Its general properties indicate that 3132 also belongs to this class of products. The high solubility of the ash is another characteristic of these sirups.

The rock candy sirups, 3249 and 3210, are marked by high percentages of sucrose and low percentages of invert sugar and ash.

Nos. 3187 and 3223 are flavored and colored sugar solutions.

The quantities of sulphur dioxide in the golden sirups are in all cases low, but in No. 3132, the only sample of this class in which zinc and tin were determined, the quantities fall within the range observed in case of molasses.

The low lead number and malic acid values for these products are noteworthy.

Misbranding

The following points in which the labels appear misleading or otherwise not in conformity with the requirements of the law, are noted:

3244: Labelled "Cane Syrup," but its lack of cane-flavor, its salty taste, and general composition indicate that is is not a cane sirup, but a refinery or sugar sirup.

3248: Bears a device purporting to be a maple leaf, which suggests a maple product contrary to the fact in this case.

REFERENCE ON SUGAR-CANE PRODUCTS

1. C. A. Browne, Jr. and R. E. Blouin: The Chemistry of Sugar-cane and Its Products in Louisiana: Bull. No. 91. (1907) La. Agr. Exp. Sta., p. 27.
2. H. W. Wiley: Sugar-cane Culture in the Southeast for the Manufacture of Table Syrups: Bull. No. 75, Bureau of Chemistry, U. S. D. A., p. 40.
3. Reference 1, pp. 34-6.
4. H. W. Wiley: Experiments in the Culture of Sugar-cane and Its Manufacture into Table Sirup: Bull. No. 93, Bureau of Chemistry, U. S. D. A., pp. 12-15.

5. Reference 1, pp. 45-78.
6. Secretary of Agriculture: Standards of Purity for Food Products: Cir. No. 19, Offices of the Secretary, U. S. D. A., p. 10.
7. Reference 1, p. 90.
8. H. W. Wiley: Foods and Food Adulterants, Pt. VI., Bull. 13, Division of Chemistry, U. S. D. A., 1892, pp. 683-719.
9. Babbington: Bull. 25, Inland Rev. Dept., Canada; Leach, Food Inspection and Analysis, 2nd Ed., p. 568.
10. Reference 6.
11. Henry Leffman and William Beam: Select Methods in Food Analysis: 2nd. Ed., 1905, p. 124. See also H. W. Wiley, Pt. VI, Bull. 13, Bureau of Chemistry, U. S. D. A., (1892), p. 713.
12. Food Inspection Decision 134 Office of the Secretary, U. S. D. A., April 12, 1911.
13. Food and Drug Law of Louisiana: The Revised Food and Drug Regulations of the Louisiana State Board of Health and Food Standards, as Revised October 21, 1908, pp. 37-38.
14. Reference 1, p. 92.
15. R. E. Blouin; P. E. Achinard, and J. A. Hall, Jr.: Effects on the Human System of Louisiana Manufactured Syrups and Molasses. Bull. 94, Louisiana Agr. Exp. Sta., 1907, p. 25.
16. H. W. Wiley: General Results of the Investigations showing the Effect of Sulphurous Acid and Sulphites upon Digestion and Health. Cir. No. 37, Bureau of Chemistry, U. S. D. A.
17. J. H. Gladstone: Quart. Jour. Chem. Soc., 7, 195; quoted by Roseco and Schorlemmer, Treaties on Chemistry, 1st. Ed., III, Pt. 2, p. 528.
18. Salkowski: Ztschr. physiol. Chem. *3*, 79.
19. Fileti: Ber. Chem. Ges., *8*, 441.
20. A. E. Leach, Food Inspection and Analysis, 2nd Ed., p. 897.
21. Reference 8, p. 702.
22. C. A. Browne, Jr.: The Chemistry of Raw Sugar Production: School of Mines Quarterly, *32*, 226.
23. S. P. Sadtler: Handbook of Industrial Organic Chemistry, 2nd Ed., p. 153.
24. Lock and Newlands Bros.: Sugar (188), p. 672.
25. Wallace: Quoted by Allen, Commercial Organic Analysis, 2nd Ed., I, 257; and by Sadtler, Ref. 23, p. 153.
26. Reference 6. p. 10.

GLUCOSE, or "CORN SIRUP"

Glucose, as the term is used in American commerce, is a viscous liquid prepared by the partial hydrolysis of corn starch. The nature of the changes which starch undergoes in the process has been quite fully stated in the introductory pages.

T. B. Wagner[1], of the Corn Products Refining Company, in a condensed description of the present mode of manufacture of this product, states that the starch separated from the corn by special processes, is suspended in a large volume of water containing a very little hydrochloric acid and is then heated under high pressure in tall, thick-walled copper converters until the starch is decomposed, the operation requiring about ten minutes. The liquid is then passed to neutralizing tanks where its acid is neutralized by the adition of soda ash, which acts upon the hydrochloric acid to form common salt, whose presence in small amount in the final product accounts for its slightly salty flavor. The neutralized liquid is then filtered to remove certain impurities, such as the fiber, etc., derived from the corn, and evaporated to a density of 30° Baume. The partially concentrated liquid is then decolorized by passing it through three successive bone-char filters, and finally condensed in vacuum pans to a density of 42° to 45° Baume.

The factory determinations of density are made, according to Gudeman[2], at a temperature of about 140° F. and the results calculated to the equivalent specific gravity at 100°F; the temperature correction being 1° Baume additional for 40° F. decrease in temperature.

The standard proclaimed by the Secretary of Agriculture for this product is:[3]

> "*Glucose, mixing glucose, confectioner's glucose*, is a thick, sirupy, colorless product made by incompletely hydrolyzing starch, or a starch-containing substance, and decolorizing and evaporating the product. It varies in density from forty-one (41) to forty-five (45) degrees Baume at a temperature of 100° Fah. (37.7°C.), and conforms in density, within these limits, to the degree Baumé it is claimed to show, and for a density of forty-one (41) degrees Baumé contains not more than twenty-one (21) per cent. of water and for a density of forty-five (45) degrees not more than fourteen (14) per cent. of water. It contains on a basis of forty-one (41) degrees Baumé not more than one (1) per cent. of ash, consisting chiefly of chlorids and sulphates."

This product is used not only in the preparation of "table sirups," but very extensively as a sugar substitute in the making of fruit products, such as jellies, jams, preserves and fruit butters, and of confectionery. When used as an ingredient of the latter classes of products it is usually called "glucose."

There has been an interesting discussion concerning the name this product should bear. Some food authorities have believed that the term "sirup" should be reserved for products conforming in origin and preparation to the national standard for sirup which has been stated on an earlier page, for the reasons that the best usage in food nomenclature has established this meaning for the term, that the interests of the people are best protected by a definite rather than a broad, loose usage of food names, and that the difference in the qualities of true sirups (consisting chiefly of sugars) and of mixing glucose is so pronounced as to make the discrimination in names highly useful to the careful buyer. On the other hand, the manufacturer has objected that the word "glucose" has been given so many undesirable associations in the minds of the general public as to make the compulsory use of that name for their product a hardship, has adduced a large volume of testimony from scientists to show that the word "sirup" has been very broadly used, and has urged that, since there is no commercial corn sirup corresponding to the narrower definition of the words, the application of the name to the liquid glucose is not misleading; and finally, claimed that such use of the word "sirup" involved no more than its use in "refiners' sirup," which, by reason of established popular usage, had been recognized as a name for refiners' molasses. The Board of Regulation created by the National Food and Drugs Act of June 30, 1906, decided[4] that it is lawful, under that Act, to label this product "corn sirup" and also that if to corn sirup there is added a small percentage of refiners' sirup, a product of the cane, the mixture is not misbranded if labeled "corn sirup with cane flavor." The practical outcome of this decision has been the use of the generic term "sirup" for mixtures of glucose with small amounts of other saccahrin liquids, and the use of the qualifier "with cane flavor" for preparations whose flavor has no clearly recognizable resemblance to that of the sugar-cane itself, nor of sugar-cane sirup. If the buyer takes the precaution, however, to examine the finer print on the labels of such goods subjects of inter-state commerce, he will observe that, under the regulations governing the labeling of compounds, the "corn sirups" usually bear statements of the kinds and proportions of the principal ingredients.

Mixing glucose is a white, or faintly yellowish viscous liquid, of a consistence often described as "sirupy." In fact, however, the dextrin it contains makes its consistence very different from that of sirups proper, and causes it to resemble in this respect glycerine or very thickly mucilaginous liquids rather than sugar solutions. It is not readily fermentable and, in mixture with cane sugar products, retards the crystallization of the sugar. Its flavor is, however, so slightly sweet and otherwise so neutral that it has found no acceptance by the public as a table article, except in admixture with other substances that serve to favor the compound. The unmixed glucose dissolves rather slowly in cold water, much more readily in hot water.

Because of the fact of its use as an adulterant in many food products, there is probably much truth in the argument of the manufacturer that the consumer attaches many unpleasant notions to the word "glucose." As a matter of fact, the components of glucose,—dextrose, maltose, and dextrin,—are recognized as nutritious foods. The National Academy of Science some years ago, affirmed its wholesomeness, and there is no objection, on the score of cleanliness, to the present methods of manufacture of the American product. Dextrose is one of the valuable sugars, in fruits and in cane sirup; according to Charrin and Brocard[5], maltose responds more readily to the digestive fluids of the human body than do milk sugar and ordinary cane-sugar; while dextrin is one of the valuable constituents of every baked flour product.

Formerly, for the sake of securing a water-white product, bisulphite of soda was used in the last stages of the neutralizing process, and thus a little sulphur dioxide was introduced into the glucose. This ingredient had the effect of making glucose candy harden better. At the present time, however, the manufacturers, stimulated by prosecutions under the food laws of Pennsylvania and other States, appear to have eliminated this undesirable admixture, with the consequent removal of this ground of objection. Arsenic was reported, some years ago, in English glucoses made by the use of sulphuric acid prepared from pyrites; but it is said that pyrite products are not used in the American glucose factories, and recent analyses of the glucose on the American market show a commendable freedom from this impurity.

The composition of mixing glucose has not been at all frequently reported in full. Wagner[1] says that the average American product contains:

	Per cent.
Water,	19.0
Dextrose,	38.5
Dextrin,	42.0
Ash,	0.5
	100.0

But there is, in this statement, no mention of maltose and nitrogenous bodies, which are always present; nor of unfermentable condensation or reversion products, formerly called by the collective name, *gallisin*, which are probably always present in some degree.

Harrington[6] gives the analyses of five samples of unmixed glucose from the Chicago refinery as follows:

No.	Color	Water	Solids	Reducing sugars (Glucose)	Solids, not sweet
		%	%	%	%
5	Water white,	20.18	79.82	35.53	44.29
23	Water white,	19.20	80.80	41.15	39.65
24	Brownish red,	19.20	80.80	38.34	42.46
25	Yellowish,	19.90	80.10	38.34	41.76
28	Dark brown red,	18.90	81.10	38.34	42.76

All these samples were somewhat acid.

Leach[7] gives the following percentage range for the principal ingredients in glucose:

	%
Dextrin,	29.8 — 45.3
Maltose,	4.6 — 19.3
Dextrose,	34.3 — 36.5
Ash,	0.32 — 0.52
Water,	14.2 — 17.2

The writer has examined, in connection with the present investigation, five samples, taken from wholesaler's stocks, and marked "'Confectioners' glucose (43° B)" with results as follows:

Sample Mark.	A	3A	B	D	E
Specific gravity (60°F.),	1.445	1.455	1.433	1.440	1.435
Refractive index (28°C.),	1.5023	1.4965	1.4988	1.4963	1.4964
Polarizations:					
Direct (20°C.),	166.4	180.8	167.4	173.8	175.6
Indirect (20°C.),	163.5	179.3	165.0	173.8	172.0
Indirect (87°C.),	151.8	173.8	159.1	162.4	165.9
Water (by difference, per cent.),	14.85	17.05	16.20	17.15	17.10
Solids (Geerlig's table, per cent.),	85.15	82.95	83.80	82.85	82.90
Reducing sugars as dextrose (per cent.)	39.35	32.06	38.34	36.72	35.24
Non-reducing organic solids (by difference, per cent.),	45.47	50.41	45.06	45.72	47.31
Ash,	.33	.48	.40	.41	.35
Percentage composition of organic solids:					
Reducing sugars,	46.4	38.9	46.0	44.5	42.7
Non-reducing substances,	53.6	61.1	54.0	55.5	57.3
Special Properties:					
Ash, water soluble, per cent.,	.23	.38	.30	.25	.29
Ash, water insoluble, per cent.,	.10	.10	.10	.16	.06
Ash ratio, insoluble to soluble,	2.3	3.8	3.0	1.6	4.8
Ash alkalinity:					
Water soluble (Cc.),	.26	.36	.34	.34	.36
Water insoluble (Cc.),	.22	.26	.22	.34	.18
Total (Cc.),	.48	.62	.56	.68	.54
Sulphuric acid, SO_3 in ash (per cent. in syrup),	.0137	.0343	.0206	.0686	.0343
Chlorin in ash (per cent. in syrup),	.07	.06	.06	.04	.04
Corresponding percentage of common salt,	.12	.10	.10	.07	.07

None of these samples gave off sulphur dioxide upon distillation with steam, and all were found free from saccharin and benzoic and salicylic acids.

The specific gravities, corrected to 100°F. by the subtraction of 1° Beaume from the equivalent of the specific gravities at 60°F., ranged from 42.8° to 44.35° Beaume. The readings were taken with a Westphal balance, but owing to the viscosities of these liquids at the temperature of observation (60°F.), it is believed that the method is much less delicate as an indication of the water and solids contents than is the determination of the refractive index, the applicability of the refactometer to this determination in glucose having been indicated by Bryan's[8] results.

The polarizations of these samples at 20° C. before treatment for inversion by the Clerget method gave readings ranging from 166.4° to 180.8° Ventzke, average 172.8°. The readings at the same temperature *after* inversion, which took place upon standing at room temperature for 24 hours, after the acid addition, rather than by heating to 68° C. in fifteen minutes, showed decreases ranging from nothing to 3.6°, average 2.1°; and at 87° C. further decreases ranging from 5.5° to 11.7°, average 8.1° Ventzke; making the readings at

87° C. after inversion from 7.0° to 14.6°, average 10.2° Ventzk lower than those observed at 20° C. before inversion; so that th average readings after inversion were, at 20° C., 170.7°; at 87° C. 164.7° Ventzke. The decrease in rotation upon heating to 87° C. i not chiefly due to hydrolysis of the dextrin, for upon cooling agai to 20° C., the same solution increases in reading to near the figur obtained after standing for 24 hours; and upon being again heate to 87° and re-cooled to 20° C., shows, at these temperatures, about th same degrees of activity as were first observed at the respective temperatures. These changes with the conditions of observation, must in the case of mixtures with sucrose-containing products, affect th determinations of cane-sugar, and also those of invert sugar by th polarimetric method.

Leach[9] proposed that the maximum polarization at 20° C., uninverted, be accepted as 175° V.; his later investigations showed tha 42° B. glucose made more recently polarizes as low as 162.4° V, and he judges that his former figure may be too high to represent th mixing glucose now in use for admixture with molasses, sirups, etc. It has been stated by various writers that glucose is sold of density varying with the purposes of its use; but Gudeman[2] declares that this is not the fact, but indicates that the variations in optical activity and in density are due to lack of entire control of the manufacturing operations. He affirms that the observed range of optical activity in goods of substantially the same density is too great to make practicable the use of Leach's suggestion even for an approximate calculation of the percentage of glucose in mixtures from their observed optical activity.

Leach's proposal has, however, been adopted by the Association of Official Agricultural Chemists, except in cases where much invert sugar is present, in which case the calculation is based upon the polarization at 87° C., and 163° V. is used as the glucose reading for that temperature.

The percentages of reducing sugars found have been calculated as dextrose. Since maltose has a considerably greater reducing power than dextrose, the computed percentages are doubtless somewhat too high, the excess varying with the quantities of maltose present in the glucoses.

The ash percentages are very small, and the ash is chiefly soluble in water, though composed in smaller degree than was anticipated, of chlorids and sulphates.

Samples Analyzed

The official sampling agents submitted a relatively large number f samples whose labels declared, more or less plainly, that they ontained "corn sirup." In some cases the main label contained the name "Corn sirup with cane flavor," in others the main name was simply "sirup" or "table sirup" with a more or less clear declaration hat "corn sirup" formed part of the material, while in still other ases a declaration of the compound nature of the product was made r the names of the ingredients were combined to form the name of the mixture. All samples bearing such labels are described in the following list:

Group No.	Sample No.	
1.	3257	Alabama Georgia Syrup Co., Montgomery, Ala.: Alaga,* Alabama-Georgia Co's Cane and Corn Compound. A Blend of Pure Georgia Ribbon Cane Syrup and Corn Syrup. To keep same from Sugaring or Souring. Bought of the Mohican Co., Easton, Pa. Price, 10 c.
2.	3217	M. H. Alexander Co., Cincinnati, O. Dove Brand Refined Molasses and Corn Syrup. 65 % Pure Molasses, 35 % Pure Corn Syrup, thoroughly Refined. Contains Sulphur Dioxide. None Better for Any Purpose. Bought of J. Gray & Co., Williamsport, Pa.
3.	3234	Arbuckles' & Co., Pittsburg, Pa. Pond Lily Table Syrup. Extra Quality. Compound, 90 % corn syrup, 10 % sugar syrup. Contains Sulphur Dioxide. Bought of M. Dwyer, Pittsburg, Pa.
4.	3246	Atlas Specialty Co., Inc., Richmond, Va. Silk Velvet Brand Corn Syrup. Maple Flavor. Smooth as the name indicates. 1/10 % benzoate of soda. 85 % corn syrup, 15 % Refiners' Syrup. Bought of Merrill & Hopper.
5.	3194	Central Molasses and Syrup Refinery, Philadelphia, Pa. Family Table Syrup. Compound of Corn and Refiners' Syrup. Bought of E. N. Michael, Reading, Pa.
6.	3138	Central Molasses and Syrup Refinery, Philadelphia, Pa. Family Table Syrup.* Compound of Corn and Refiners' Syrup. Bought of H. J. Bracony, Harrisburg, Pa. Price, 10 c.
7.	3273	Central Molasses and Syrup Refinery, Philadelphia, Pa. Our Favorite Brand Syrup. Stamped "Compound, Table." A compound of the best pure sugar syrup and corn syrup by which the flavor is made smooth and sweet, and the body and character generally improved. Bought of J. B. Warren, Gettysburg, Pa. Price, 10 c.
8.	3284	Corn Products Manufacturing Co., Davenport, Iowa. Atlas Corn Syrup with Cane Flavor.* 90 % Corn Syrup, 10 % Refiners' Syrup. Compound. It is of the highest quality and prepared according to U. S. Standards. Bought of A. F. Clapper, Everett, Pa.
9.	3159	Corn Products Manufacturing Co., Davenport, Iowa. Golden Glory Corn Syrup with Cane Flavor.* Compound 90 % Corn Syrup, 10 % Refiners' Syrup. 2½ lbs. net weight. Bought of D. P. Lantz, Lancaster, Pa. Price, 12 c.
10.	3272	Corn Products Manufacturing Co., Davenport, Ia. Royal Corn Syrup.* Cane Flavored, Choice Quality. 2½ lbs. net weight. 10 % Refiners' Syrup, 90 % Corn Syrup. Compound. Delicious, Wholesome, Pure. Bought of Wagner Bros., Lewistown, Pa. Price, 12 c.
11.	3127	Corn Products Manufacturing Co., Davenport, Ia. Rex Corn Syrup with Cane Flavor.* Compound. 90% Pure Corn Syrup, 10 % Choicest Refiners' Syrup. 2 lbs. net weight. Bought of D. Pollock, Harrisburg, Pa.

Group No.	Sample No.	
12.	3200	Corn Product Manufacturing Co., Davenport, Ia. Universal Corn Syrup with Cane Flavor.* 90 % Corn Syrup, 10 % Refiners' Syrup. Compound. Its ingredients are of the highest quality and prepared according to U. S. Standards. Bought of J. J. Bobbin, Shenandoah, Pa.
13.	3274	Corn Products Refining Co., New York. Banquet Table Syrup.* Corn Syrup, 90 %. Refiners' Syrup, 10 %. 2 lbs. net weight. Bought of J. B. Urnians, Gettysburg, Pa.
14.	3254	Corn Products Refining Co., New York. Blue Knot Table Syrup. Corn Syrup, 90 %, Refiners' Syrup, 10 %. 2 lbs. net weight.. Bought of W. H. Schug, Easton, Pa.
15.	3212	Corn Products Refining Co., New York. Geo. Bubb & Son, Distributors, Williamsport, Pa. Haleeka Club Table Syrup. Corn Syrup, 90 %, Refiners' Syrup, 10 %. 2½ lbs. net weight. Pure and Wholesome. First Quality. Bought of Geo. J. Koons, Williamsport, Pa.
16.	3259	Corn Products Refining Co., New York. Drake & Co., Distributors, Easton, Pa. Golden Crown Table Syrup.* Corn Syrup 90 %, Refiners' Syrup 10 %. 2 lbs. net weight. Pure and Wholesome. Bought of Caparaso & Co., Easton, Pa.
17.	3256	Corn Products Refining Co., New York. Drake & Co., Distributors. Golden Crown Fancy Table Syrup.* Pure and Wholesome. Compound. Refiners' Syrup 10 %. Corn Syrup, 90 %. Bought of W. H. Schug, Easton, Pa.
18.	3253	Corn Products Refining Co., New York. Geo. M. Dunlap Co., Distributors. Dunlap's Compound Table Syrup.* Corn Syrup, 90 %; Refiners' Syrup, 10%. 2½ lbs. net weight. Pure and Wholesome. For General Table Use. None Better. Geo. M. Dunlap & Co., Chester, Pa.
19.	3281	Corn Products Refining Co., New York. Eagle Corn Syrup with Corn Flavor.* Corn Syrup, 90 %, Refiners' Syrup, 10 %. Bought of Crabbe & Co., Hyndman, Pa. Price, 10 c.
20.	3153	Corn Products Refining Co., New York. Globe Brand Corn Syrup with Cane Flavor.* Corn Syrup 90 %, Refiners' Syrup 10 %. Tops the Globe. Pure, Wholesome. Bought of Mohican Co., Wilkes-Barre, Pa. Price, 10 c.
21	3255	Corn Products Refining Co., New York. Gold Ribbon Table Syyrup.* Corn Syrup, 90 %; Refiners' Syrup, 10 %. 3 lbs. net weight. Pure and Wholesome. Bought of W. Schug, Easton, Pa.
22	3135	Corn Products Refining Co., New York. Harrisburg Grocery and Produce Co., Harrisburg, Pa. (Distributors). Sweet Clover Brand Table Syrup.* Corn Syrup, 90 %; Refiners' Syrup, 10%. 2 lbs. net weight. Bought of Wm. Kimmel, Harrisburg, Pa. Price, 10 c.
23.	3161	Corn Products Refining Co., New York. "Kairomel Brand" Corn Syrup with Cane Flavor.* Pure and Wholesome. 90 % Corn Syrup; 10 % Refiners' Syrup. 2½ lbs. net weight. Bought of Franklin Grocery, Lancaster, Pa. Price, 12 c.
24.	3134	Corn Products Refining Co., New York. Karo Corn Syrup with Cane Flavor.* Pure and Wholesome. 85 % Corn Syrup, 15 % Refiners' Syrup. 2 lbs. net weight. Bought of Kreidler Bros. Harrisburg, Pa. Price, 10 c.
25.	------	Corn Products Refining Co., New York. Karo Extra Quality.* To Meet a Demand for New Delicate Flavor and Color. 85 % Corn Syrup, 15 % Granulated Sugar Syrup. Vanilla Flavor. Bought of ——— ———. Price, —.
26.	3184	Corn Products Refining Co., New York, by Manierre-Yoe Syrup Co., Chicago. Reeves, Parvin & Co., Distributors, Philadelphia, Pa. White Clover Brand Table Syrup. Corn Syrup 90 %, Refiners' Syrup, 10 %. 2½ lbs. net weight. Pure and Wholesome. First Quality. Bought of Bentley & Kurtz, Reading, Pa.
27.	3280	Corn Products Refining Co., New York. Santee Brand Corn Syrup with Cane Flavor.* Corn Syrup 90 %, Refiners' Syrup 10 %. Two Pounds net Weight. Bought of Crabbe & Co., Hyndman, Pa. Price, 10 c.
28.	3136	Corn Products Refining Co., New York. White Flake Syrup.* Corn Syrup, 85 %. Granulated Sugar Syrup 15 %. 2 lbs. net weight. Bought of New York Grocery, Selinsgrove, Pa. Price, 10 c.
29.	3237	P. Duff & Son, Pittsburg, Pa. Duff's Fancy Table Syrup. Compound. 80 % Pure Corn Syrup, 20 % Pure Cane Syrup. Bought of A. Serafinn, Pittsburg, Pa.

Group No.	Sample No.	
30.	3236	P. Duff & Sons, Pittsburg, Pa. Duff's Syrup. Compound. 80 % Pure Corn Syrup, 20 % Pure Cane Syrup. Contains Sulphur Dioxide. Bought of Mrs. B. Aaron, Pittsburg, Pa.
31.	3141	Evans-Burtnett Co., Harrisburg, Pa. New Century Compound Fancy Table Syrup. Bought of R. J. Peter & Son, Harrisburg, Pa. Price, 10 c.
32.	3144	Great Atlantic and Pacific Tea Co., Inc., Jersey City, N. J. A. & P. Choice Table Syrup.* Compound. Corn Syrup 90 %, Refiners' Syrup 10 %. Bought of A. & P. Tea Co., Scranton, Pa. Price, 10 c.
33.	3196	Hooven Mercantile Co., Reading, Pa. Heron Table Syrup. Compound. Corn and Refiners' Syrup. Superior Quality. Bought of J. W. Fenstermacher, Reading, Pa.
34.	3182	Hooven Mercantile Co., Reading, Pa. Sunbeam Table Syrup. Superior Quality. Compound. Corn and Refiners' Syrup. Superior Quality. Bought of J. H. Cassel, Reading, Pa.
35.	3145	Hudson Mfg. Co., New York. The Southern Molasses Co., Distributors, New York. B. & O. Brand. N. O. Molasses and Corn Syrup.* Will give that rich yellow color so much desired by good cooks in brown bread, ginger snaps, etc. Contains Sulphur Dioxide. Bought of A. & P. Tea Co., Scranton, Pa.
36.	3235	James A. McAteer & Sons, Inc., Pittsburg, Pa. Liberty Brand Compound Molasses and Corn Syrup. Contains Sulphur Dioxide. Bought of Orazio & Bro., Pittsburg, Pa.
37.	3283	Manierre-Yoe Company, Chicago, Distributors: American Beauty Brand Corn Syrup with Cane Flavor.* Corn Syrup 90 %, Refiners' Syrup 10 %. 2½ lbs. net weight. Bought at Everett, Pa. Price, 10 c.
38.	3263	S. Scheiver & Co., Easton, Pa. Vanilla Drips Brand Table Syrup. A Compound Cane Syrup and Glucose. Bought of J. Schuyler & Co., Easton, Pa.
39.	3183	Star Light Molasses Company, Philadelphia, Pa. Fancy N. O. Molasses Star Light Brand. Compound. Guaranteed to Bake. Bought of J. H. Cassel, Reading, Pa.
40.	3267	Steuart, Knatz & Co., Baltimore, Md. Golden Crown Syrup.* 60 % Corn Syrup, 40 % Sugar Refinery Syrup. Bought of G. W. Stewart, York, Pa. Price, 10 c.
41.	3133	Steuart, Knatz & Co., Baltimore, Md. Golden Crown Fancy Table Syrup.* A Blend of 40 % Sugar Refining Syrup and 60 % Corn Syrup. Bought of Kreidler Bros., Harrisburg, Pa. Price, 12 c.

Samples marked * bore numbers of guarantees filed with the Secretary of Agriculture of the United States.

METHODS OF ANALYSIS

The methods of analysis employed in case of these mixtures were the same as for the preceding groups. They serve only indirectly, however, for an estimation of the proportions of glucose present and for an indication of the quality of the saccharin liquids used to impart flavor to the chief ingredient of the mixture, glucose.

It will be recalled that, under our conditions of inversion, all but one of the samples of confectioner's glucose polarized slightly less after inversion than before, the temperatures of observation being 20° C. at both times, and that the average depression was 2.1° V. In the tables following, the quantities of cane-sugar present have been computed by the usual Clerget formula, which assumes that the decrease by inversion is wholly due to the conversion of the cane-sugar, which polarizes to the right, into invert sugar, which polarizes to the left. If it be assumed, however, that the glucose in these mixtures was depressed by inversion in like manner with the pure glucose, part of the change in activity observed after inversion must be ascribed to the glucose. The result, in case of the average of the 90 : 10 mixtures, would be to decrease by about 1.3 per cent the cane-sugar percentage stated in the tables.

In calculating the proportion of glucose present, the official formula[10] prescribed for use with polarization at 87° C. is

$$\text{Glucose} = \frac{\text{Polarization at } 87^\circ \text{ C., 200 m. m. tube, deg. Ventzke} \times 100}{163}$$

The divisor being the average polarization, under these conditions, of glucose which polarizes at 175° V. before inversion and at 20° C.

ANALYSES OF "CORN SIRUPS" AND GLUCOSE COMPOUNDS

I. Physical Properties and General Chemical Composition

Group number	Agent's number	Flavoring Ingredient Named on Label.	Per cent. glucose claimed	Specific gravity	Refractive index. (28°C)	Polarization (V°)			Moisture	Solids	Cane-sugar (Clerget formula)	Reducing sugar as dextrose	Dextrin, etc., by difference	Ash	Glucose† a (87°C.)÷1.63
						Direct 20°C.	Invert 20°C.	Invert 87°C.							
									%	%	%	%	%	%	%
1	3257	Ribbon cane syrup,	?	1.363	1.4683	87.8	48.6	59.8	28.10	71.90	29.55	19.74	21.73	.94	36.7
2	3217	Refined molasses,	?	1.399	1.4779	62.0	24.3	35.2	24.35	75.65	28.41	36.06	6.61	4.57	21.6
3	3234	Sugar syrup,	90	1.402	1.4872	138.0	128.3	125.8	20.65	79.35	7.31	35.78	35.37	.89	77.2
4	3246	Refiners' syrup,	85	1.422	1.4799	157.0	144.3	138.6	23.50	76.50	9.57	27.52	38.86	.55	85.0
5	3194	Refiners' syrup,	?	1.404	1.4823	138.0	127.6	125.4	22.55	77.45	7.84	32.74	35.62	1.25	76.9
6	3138	Refiners' syrup,	?	1.403	1.4833	134.6	123.4	122.3	22.15	77.85	8.44	33.14	35.07	1.18	75.0
7	3273	Sugar syrup,	?	1.408	1.4828	122.0	103.6	107.8	22.35	77.65	13.87	26.88	34.38	2.52	66.1
8	3284	Refiners' syrup,	90	1.390	1.4768	138.2	135.7	130.9	24.75	75.25	1.88	34.74	37.77	.86	80.3
9	3159	Refiners' syrup,	90	1.389	1.4793	134.2	132.0	128.5	23.75	76.25	1.66	33.06	40.91	.62	78.8
10	3272	Refiners' syrup,	?	1.393	1.4816	140.8	137.7	133.3	22.80	77.20	2.34	33.74	40.22	.90	81.8
11	3127	Refiners' syrup,	90	1.404	1.4814	146.8	140.4	138.2	22.90	77.10	4.82	35.76	35.49	1.03	84.8
12	3200	Refiners' syrup,	90	1.395	1.4837	154.2	148.5	144.1	22.00	78.00	4.30	27.24	45.32	1.14	88.4
13	3274	Refiners' syrup,	90	1.383	1.4754	145.0	142.6	138.2	25.35	74.65	1.81	30.30	40.90	1.61	84.8
14	3254	Refiners' syrup,	90	1.387	1.4773	130.8	121.0	119.0	24.55	75.45	7.39	32.22	34.97	.87	73.0
15	3212	Refiners' syrup,	90	1.385	1.4798	139.0	132.0	127.6	23.55	76.45	5.35	31.42	38.58	1.10	78.3
16	3259	Refiners' syrup,	90	1.381	1.4753	135.8	126.1	123.2	25.35	74.65	7.31	32.58	33.71	1.05	75.6
17	3256	Refiners' syrup,	90	1.400	1.4835	149.2	142.6	140.4	22.05	77.95	4.98	35.58	36.65	.74	86.1
18	3253	Refiners' syrup,	90	1.378	1.4744	136.4	128.7	123.2	25.70	74.30	5.05	32.48	35.82	.95	75.6
19	3281	Refiners' syrup,	90	1.385	1.4760	138.4	135.3	127.6	25.05	74.95	2.34	32.98	38.70	.93	78.3
20	3153	Refiners' syrup,	90	1.412	1.4873	120.0	104.1	110.0	20.60	79.40	11.99	32.46	33.64	1.32	67.5
21	3255	Refiners' syrup,	90	1.389	1.4794	140.0	132.0	127.8	23.70	76.30	6.05	29.10	40.06	1.09	78.3
22	3135	Refiners' syrup,	90	1.393	1.4806	150.0	143.4	145.6	23.25	76.75	4.98	32.26	38.74	.77	89.3
23	3161	Refiners' syrup,	90	1.388	1.4809	140.8	134.2	128.7	23.10	76.90	4.98	35.92	35.19	.81	79.0
24	3134	Refiners' syrup,	85	1.383	1.4743	125.0	115.5	116.6	25.75	74.25	7.16	33.82	32.08	1.19	71.2
25	K	Granulated sugar syrup,	85	1.392	1.4813	153.0	128.6	136.0	22.95	77.05	18.39	25.82	32.42	.42	83.4

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† a = Polarization reading.

ANALYSES OF "CORN SIRUPS" AND GLUCOSE COMPOUNDS—Continued

I. Physical Properties and General Chemical Composition

Group number	Agent's number	Flavoring Ingredient Named on Label.	Per cent. glucose claimed	Specific gravity	Refractive index. (28°C)	Palarization (V°)			Moisture	Solids	Cane-sugar (Clerget formula)	Reducing sugar as dextrose	Dextrin, etc., by difference	Ash	Glucose† a (87°C.)÷1.63
						Direct 20°C.	Invert 20°C.	Invert 87°C.							
									%	%	%	%	%	%	%
26	3184	Refiners' syrup,	90	1.383	1.4872	141.4	134.6	132.0	20.65	79.35	4.90	31.36	41.89	1.20	81.0
27	3280	Refiners' syrup,	90	1.379	1.4734	147.6	146.1	140.8	26.10	73.90	1.13	31.20	40.82	.79	86.4
28	3136	Granulated sugar syrup,	85	1.399	1.4843	153.8	143.9	139.7	21.75	78.25	7.46	29.56	40.70	.53	85.7
29	3237	Cane syrup,	80	1.400	1.4774	122.4	107.4	107.8	24.50	75.50	11.31	28.88	33.15	2.16	66.7
30	3236	Cane syrup,	80	1.397	1.4823	147.0	139.0	136.4	22.55	77.45	6.03	30.16	39.95	1.31	83.7
31	3141	Refiners' syrup,	?	1.416	1.4843	110.2	88.0	94.6	21.75	78.25	16.73	30.30	28.39	2.83	58.0
32	3144	Refiners' syrup,	90	1.383	1.4765	138.8	132.9	129.8	24.85	75.15	4.45	32.78	36.80	1.12	79.6
33	3196	Refiners' syrup,	?	1.420	1.4890	131.8	116.6	115.7	19.95	80.05	11.46	32.64	33.97	1.98	71.0
34	3182	Refiners' syrup,	?	1.399	1.4826	143.2	134.6	132.2	22.45	77.55	6.48	31.36	38.42	1.29	81.1
35	3145	N. O. molasses,	?	1.395	1.4793	90.0	52.8	75.7	23.75	76.25	28.04	31.80	13.66	2.75	46.4
36	3235	Molasses,	?	1.404	1,4813	75.2	41.8	48.4	22.95	77.05	25.18	26.94	24.16	.77	24.7
37	3283	Refiners' syrup,	90	1.383	1.4781	137.0	133.8	129.8	24.25	75.75	2.41	32.00	40.43	.91	79.6
38	3263	Corn syrup,	?	1.414	1.4848	90.2	60.9	68.2	21.55	78.45	22.09	22.44	29.95	3.97	41.8
39	3183	N. O. molasses,	?	1.420	1.4848	47.6	—2.2	15.4	21.55	78.45	37.54	13.60	17.72	4.59	9.5
40	3267	Refiners' syrup,	60	1.412	1.4812	109.6	90.6	96.4	23.00	77.00	14.32	31.22	29.26	2.20	59.1
41	3133	Refiners' syrup,	60	1.412	1.4822	154.6	140.6	139.5	22.60	77.40	10.55	25.00	39.66	2.19	85.6

†a = Polarization reading.

ANALYSES OF "CORN SIRUPS" AND GLUCOSE COMPOUNDS

II. Special Chemical Characters

Group Number	Agent's number	ASH		Ash ratio: Soluble÷Insoluble	Chlorin	Sodium chlorid equivalent	Sulphuric acid, SO_3	Sulphur dioxide, SO_2
		Water soluble	Water insoluble					
		%	%		%	%	%	P.p.m.
1,	3257	.67	.27	2.5	--------	--------	.0857	28
2,	3217	3.656	.91	4.0	--------	--------	.3360	35
3,	3234	.69	.20	3.5	.17	.28	.0343	6
4,	3246	.47	.08	5.9	.18	.30	.0110	0
5,	3194	.99	.26	3.8	.26	.43	.0398	--------
6,	3138	1.00	.18	5.6	.25	.41	.0343	3
7,	3273	2.26	.26	8.7	--------	--------	.0343	12
8,	3284	.72	.14	5.1	.09	.15	.0151	0
9,	3159	.45	.17	2.6	.08	.13	.0617	0
10,	3272	.85	.05	17.0	.20	.33	.0343	32
11,	3127	.87	.16	5.4	.29	.48	.1125	00
12,	3200	.98	.16	6.1	.19	.31	.0782	3
13,	3274	1.32	.32	4.1	.23	.38	.0482	0
14,	3254	.64	.23	2.8	.16	.26	.0384	12
15,	3212	.88	.22	4.0	.26	.43	.0960	3
16,	3259	.80	.25	3.2	.17	.28	.0548	3
17,	3256	.61	.13	4.7	.16	.26	.0480	12
18,	3253	.79	.16	4.9	.23	.38	.0755	9
19,	3281	.79	.14	5.6	.19	.31	.0411	3
20,	3153	1.01	.31	3.3	.29	.48	.0302	12
21,	3255	.90	.15	6.0	.11	.18	.0247	3
22,	3135	.56	.21	2.7	.13	.21	.0412	9
23,	3161	.70	.11	6.4	.21	.35	.0411	0
24,	3134	.99	.20	5.0	.26	.43	.0686	6
25,	K	.31	.11	2.8	.04	.07	.0453	56
26,	3184	1.04	.16	6.5	.25	.41	.0521	6
27,	3280	.65	.14	4.1	.11	.18	.0133	00
28,	3136	.46	.07	6.6	.09	.15	.0206	12
29,	3237	1.94	.22	8.8	.47	.78	.0110	12
30,	3236	1.11	.20	5.5	.23	.38	.0523	0
31,	3141	2.39	.44	5.4	--------	--------	.0720	3
32,	3144	.87	.25	3.5	.24	.40	.0480	6
33,	3196	1.62	.36	4.5	.65	1.07	.0613	6
34,	3182	1.08	.21	5.1	.30	.50	.0523	12
35,	3145	1.98	.77	2.6	--------	--------	.3121	160
36,	3235	.58	.19	3.1	--------	--------	.0480	45
37,	3283	.78	.13	6.0	.18	.30	.0261	6
38,	3263	3.27	.70	4.9	--------	--------	.0617	0
39,	3183	3.70	.89	4.2	--------	--------	.2559	44
40,	3267	1.94	.26	7.5	--------	--------	.0652	25
41,	3133	1.95	.24	8.1	.40	.66	.0429	6

Discussion of Results

The first question naturally arising is concerning the truth of the label declarations as to the percentages of glucose in these mixtures. It will at once be noted that, except in the cases of Nos. 3246, 3200, 3256, 3135, K, 3280, 3136, 3236, and 3267, where the quantities stated agree substantially with those calculated by the formula used in the table, the quantities computed are quite remote from the label declarations; and that, except in the cases of No. 3133, where the quantity is greatly excessive, the percentages are far less than the labels declare. If the kind of flavoring liquid admixed with the glucose is correctly stated, the consumer is probably little, if at all, injured by such over-statement.

This difference is so great, however, that it requires especial consideration to determine whether any cause, other than a deliberate diminution of the proportion of glucose in the mixture, can account for it. The glucose average for the twenty samples for which 90 per cent. of "corn sirup" is stated on the respective labels, is 80.10 per cent., if we take the tabulated computations. If the calculations be based upon Leach's formula for use with the direct polarization at 20° C., adopting 175° as the maximum polarization of commercial glucose at that temperature, the average for these "90 per cent." samples is 77.30 per cent.; or, if we correct approximately the cane-sugar figures for the average decrease in optical activity upon inversion observed in the case of the confectioners' glucose we have analyzed and a proportion of 80 per cent. of glucose in the mixture, the average computed by this corrected method is 78.06 per cent.

A dilution of the mixture with water would tend to lower the polarizations and thus account, in part as least, for the observed depression. The confectioners' glucose we examined contained 83.53 per cent. of solids on the average; but a minimum of 79 per cent. is recognized as occasional in mixing glucose. For refiners' sirup, a minimum of 75 per cent. is recognized as allowable, though 79 per cent. is more nearly the average; while sugar sirups may contain as low as 65 per cent of solids. Disregarding the one case in which "sugar sirup" is the declared flavoring material, in the twenty cases for which 90 per cent. of "corn sirup" is claimed, the minimum of solids present should be 78.6 per cent., whereas the amount found was 76.39 per cent., the quantities being less than the theoretical minimum in eighteen out of the twenty cases; the average depression below the *average* for the respective ingredients represents the equivalent of 5 per cent. addition of water, either direct or indirect.

The average of the organic solids not sugar in these twenty cases, was 38.09 per cent.; if these be attributed to the glucose, thus disregarding the fraction of one per cent contributed by the refiners' sirup, the quantity would correspond to 47.60 per cent. of the glucose, if 80 per cent. be assumed as the average amount present; to 42.31 per cent. of the glucose, if 90 per cent. be regarded as the proportion of glucose present and to 44.80 per cent. for 85 per cent. of the glucose. The average percentage found in the confectioners' glucose we analyzed was 47.39 per cent.

The quantity of organic solids not sugar present in the average mixture is, in other words, what we should expect, if 80 per cent of confectioner's glucose, such as we have analyzed, were used in making the mixture. Attention has already been directed to the limitations of the analytical data obtained as they apply to the computations of organic solids not sugar. For this reason, the comparison just made is merely suggestive, not at all conclusive.

It remains to be observed that the computation of the glucose proportions stated in the table is based upon the assumption that the optical activity of the glucose used was equivalent to 163° V at 87° C. after inversion, or about 175° V at 20° C. before inversion, these being the officially accepted figures. If the hydrolysis be carried a little farther, in one case than another, the dextrin, which is highly dextro-rotatory, will be more completely converted to maltose and dextrose, which are much less optically active, although dextrorotatory. The consequence is that, without any decrease in the final quantity of solids, the optical activity of more the completely hydrolyzed glucose is reduced, possibly to a considerable degree.

Confining the calculations to the range of polarization at 87° C. observed in the confectioners' glucose samples that we analyzed in connection with this investigation, and making no correction for differences in the solid contents of the mixtures and glucoses respectively, the polariscopic reading of 130.56° V the average for the 90:10 mixtures, would correspond to 75 per cent or 86 per cent of glucose, according as 150° or 174° V, the respective extremes of the polarizations, invert, at 87° C., noted in our glucose analyses, were used for the computation.

Owing to the variable nature of the flavoring admixtures, there is nothing in the analytical data obtained in the present series of analyses, to prove the real degree of hydrolysis of the average glucose mixture under consideration; and, therefore, aside from the low solids in the mixtures, no established explanation for the low proportions of glucose indicated by the formula here employed.

The second question which arises is concerning the truth of the label statements concerning the nature of the flavoring liquids used in the mixtures and compounds.

In two cases, Group Nos. 25 and 28, sirup prepared from granulated sugar is claimed. The low ash, and, in case of No. 25, the high cane sugar content, tend to support this claim. In the case, however, of Group No. 7, the high ash is incompatible with the claim that the flavoring ingredient is "sugar sirup" in the true sense of the term, which means a solution made by dissolving sugar. Instead, the material was a substance relatively high in ash.

In 29 cases out of the 41 analyzed, the flavoring ingredient claimed is refiners' sirup. The ash in these cases ranges from .55 to 2.20 per cent, and averages 1.00 per cent. In the 19 cases in which the proportion of 90 parts of glucose to 10 of refiners' sirup is claimed, the ash range was .62 to 1.64; average 1.00 per cent. Taking 0.4 per cent of ash as the normal for the glucose, this would give us averages of 3.2 to 7.1 per cent of ash, according as we accept 20 or 10 per cent as the proportion of refiners' sirup in the mixture; both these percentages falling, however, within the range for refiners' sirup. The low figures for cane-sugar in Group Nos. 9, 13, and 27 indicate for these mixtures the use of sugar products of highly inverted character, and probably but not certainly low quality; the high ash in No. 13 points in the same direction. Owing to the variability in the proportions of sulphates found in the ash of unmixed glucose, the quantities of this constituent found in the several mixtures throw little light upon the quality of the flavoring material. On the other hand, the quantity and solubility of the ash in refinery molasses, are variable, as contrasted with these properties in glucose, but have not yet been correlated so definitely with the various grades of these refinery products, except in cases where the ash is extremely high, as to make them especially valuable for present judgment of the quality of the flavoring material in these mixtures.

The flavors of the mixtures having the names of the same ingredients were often quite unlike, especially when sugar sirup, cane sirup and refiners' sirup were the flavoring materials. In a few of the cases in which the latter was claimed, there was a slight, molasses-like flavor; in a few cases, a pronounced "butter scotch" flavor; but in the remainder, the flavor, where not affected by fermentation, was not readily likened to that of any simple material. Where large quantities of molasses were claimed, the flavor indicated the presence of this ingredient.

The quantities of sulphur dioxide found in these mixtures were, as a rule, very small, one-fifth of the samples showing none at all. It will be recalled that the legal tolerance for this added constituent covers only molasses, among these sugar products; that neither cane-sirup nor glucose comes within the protection of the proviso in which the tolerance is expressed; and that, since refining sirup also is omitted from mention, it is reasonable to regard the presence of sulphur dioxide in this refiners' product as constituting an adulteration. The same processes which led to its tolerated presence in molasses may have affected the raw sugars also, and thus led to its later appearance in the sirups constituting the secondary products of the refining operation. The writer is acquainted with no exact studies upon the question as to what amounts, if any, of sulphur dioxide are thus carried forward through the refinery from the sugar-house.

We note that Group No. 25, said to be a mixture of glucose and granulated sugar sirup, contains the highest amount, save one, of sulphur dioxide; since this is not contributed by granulated sugar, it must have entered with the glucose; yet No. 24, which bears the same brand name, but claims refiners' sirup as the flavoring ingredient, contains less than one-ninth as much of the sulphur dioxide. Group Nos. 10 and 40 also show more of this prohibited constituent than can be satisfactorily accounted for by the refinery products said to be used for the flavoring of the mixture.

The quantities apparent in Group Nos. 2, 35, 36, and 39, may be due to the molasses present; but, if so, it is to be noted that No. 39 fails to bear upon its label the required declaration of the presence of sulphur dioxide.

In the case of No. 3, such a declaration is made, but neither glucose nor sugar sirup should contain it.

Although these products are commonly sold in tin cans, the original plan of the investigation included the determination of tin and zinc in the case only of the cane-sirup and molasses. It is possible to make no statement, therefore, as to the presence or absence of these metals from these glucose mixtures.

Tests for saccharin and the preservative acids, benzoic and salicylic, gave negative results in all cases.

Misbranding

In addition to the provisions of the Food Act of May 13, 1909, that prohibit the use of false, deceptive, or misleading names, statements, designs or devices upon food labels, those provisions, also, requiring the statement, in case of food mixtures, of the mixed or compound nature of the article, and of the substance entering therein, and finally the provisions relative to the place where and size of type whereby these required declarations shall be used, apply to these glucose compounds. The law requires that all labeling required by the Act shall be on the main label, in type not less than 8-POINT BREVIER CAPS, (unless the size of the package will not permit so large type), and in such position and terms as shall be plainly seen and read by the purchaser. For the purposes of this report, it is assumed that such position is upon the front part of the label, i. e. that part containing the brand name, which is usually made visible on the retailers' shelves.

It may first be noted that the meanings of the words "corn sirup" and "with cane flavor" have not been interpreted authoritatively as they apply in the purely internal commerce of the State.

The following sets of notes sufficiently indicate the salient defects in the labels, as gauged by the law's requirements:

DECLARATION OF NATURE

Group No.	
3.	Front of label does not indicate mixed nature; the word "compound" and statement of the ingredients and of the presence of sulphur dioxide is made on the side in small type.
5.	Mixed character not indicated on front of label; and "compound" and names of ingredients appear on the back in small type.
12.	Declaration of compound nature and of the presence of sulphur dioxide, appears on the side, not the front of the label. The brand name does not indicate that the material is mixed or compounded.
14.	Name does not indicate its mixed or compound nature; statement of ingredients, while on front label, is in black type on a dark blue ground, and therefore difficultly legible.
17.	Compound nature and name of ingredients on side of label.
21.	Brand name does not show mixed nature. Names of ingredients in small type, black on red ground, on front label.
25.	Main label bears no indication of mixed nature, though the brand name does not give any indication of the nature of the article. The names of the ingredients appear on the sides of the can.
30.	Declaration of compound nature and of the presence of sulphur dioxide, appears on the side, not the front of the label. The brand name does not indicate that the material is mixed or compound.
31.	Names of ingredients omitted.
32.	Brand name does not show mixed nature. Word "compound" with names of ingredients in small type on the side of the can.
33.	The declaration of the compound nature and of the ingredients is placed in small type inconspicuously at the bottom of the main label.
34.	The declaration of the compound nature and of the ingredients is placed in small type inconspicuously at the bottom of the main label.
35.	Declaration of sulphur dioxide in small type and on the edge of the label.
36.	Presence of sulphur dioxide declared in small black letters on red ground, and on side of label.
39.	Word "compound" in very small white letters, in an inconspicuous position on the main label.
40.	Mixed nature not apparent in main name. Declaration of ingredients appears in very small letters at the bottom of the main label.
41.	Mixed nature not apparent in main name. Declaration of ingredients appears in very small letters at the bottom of the main label.

MISLEADING STATEMENTS

Group No.	
2.	Label declares, "None better for any purpose." As a matter of fact, the flavoring quality of molasses and its degree of reaction with baking soda are weakened for baking purposes, by mixing practically neutral glucose with it.
4.	Maple flavor claimed. Could not taste it.
5.	Bears device of girl with sugar-cane, no suggestion by device that at least three-fourths of the material is derived from corn.

Group No.	
6.	Bears device of girl with sugar-cane, no suggestion by device that at least three-fourths of the material is derived from corn.
7.	Label claims that the glucose makes "the best pure sugar syrup" sweet.
8.	Label states, "It is prepared according to U. S. Standards." There is no such standard for a glucose mixture with refiners' syrup, but only for the ingredients taken separately.
10.	Labelled "Pure," but contains 32 p.p.m. of sulphur dioxide.

It is clear that, in the particulars here discussed, the buyer must have much trouble in discovering the truth from the labels on many of these goods.

NET WEIGHT OF PACKAGES

Upon the labels of this class of products, the net weight of the contents has been stated on a large fraction of the labels. The net weights have been determined in these cases, with the result that, in most cases, a slight excess of contents was observed; and in the few cases of deficiency, this amounted to more than one per cent. of the stated weight in but one case, when the deficiency was about 1.7 per cent of the stated weight. In general, therefore, the consumer has little ground for complaint of short weight with respect to any of the samples thus examined.

REFERENCES ON GLUCOSE

1. T. B. Wagner: Jour. Soc. Chem. Ind., *28*, (1909), 343-348.
2. Edw. Gudemann: The Determination of Glucose: Proceedings 19th Ann. Convention, Ass'n., Official Agr. Chemists, 1902: Bull. 73, Bureau of Chemistry, U. S. D. A., pp. 65-69.
3. Secretary of Agriculture: Standards of Purity for Food Products: Circular No. 19, Office of the Secretary. p. 10.
4. Secretary of Agriculture: Food Inspection Decision 87, Feb. 13, 1908.
5. Charrin and Brocard: Comptes rendus, *134* (1902), 48-50, 188-190.
6. H. H. Harrington: The Manufacture of Cane Syrup: Bull. No. 68, Texas Agr. Exp. Station, July, 1903, p. 12.
7. A. E. Leach: Food Inspection and Analysis, 2nd Ed., p. 576.
8. A. Hugh Bryan: Jour. Am. Chem. Soc., 1908, September.
9. Reference 7, p. 622.
10. Association of Official Agricultural Chemists: Official and Provisional Methods of Analysis: Bull. No. 107 (Revised), Bureau of Chemistry, U. S. D. A. 1908, p. 71.

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lead number, malic acid value, tin and zinc, and also the tests for saccharin, benzoic and salicylic acids, by Walter Thomas, B. S. To Assistant Professor Given acknowledgment is due for many helpful suggestions.

SUMMARY

The examination of the table sirups on sale in Pennsylvania reveals the following conditions, with respect to the several classes of these products:

1. The goods sold as 'maple sirup' are, with few exceptions, true to name. Glucose has almost disappeared as an adulterant of these sirups. If ordinary cane sugar is used as an adulterant, it is within such limits that the characteristic constituents are not depressed below the range of variation they exhibit in authentic maple sirups.
2. The sirups labelled 'maple and cane' or 'cane and maple,' usually contain only small proportions of the maple product.
3. There is little sugar-cane sirup on the market.
4. The molasses on sale is practically confined to the products of the modern sugar-house. The 'New Orleans molasses' of today differs materially in flavor, sugar-richness, and probably also in acidity from the older 'open-kettle' product formerly sold under that name. The ash limits for table molasses are exceeded in but few cases, but the organic solids not sugar are, in some cases, so high as to suggest that the molasses in these cases is of very inferior grade. The quantities of sulphur dioxide are usually not high. The presence of tin and zinc in small quantities is common, and, in the latter case, suggests the need for greater care in cleansing before filling the tins in which these goods are usually retailed.
5. The samples of refined molasses submitted were too few to permit any judgment of their average quality as compared with that of the ordinary molasses.
6. The 'corn sirup with cane flavor' and 'compound molasses' formed a large fraction of the 'table sirups' on sale. The goods of the former class frequently lack cane-flavor, in the literal sense of the term. The proportions of glucose claimed on the labels are rarely exceeded in the goods. As a class, these goods contain more water than should be introduced in the ingredients named. The proportions of sulphur dioxide present are, as a rule, very low, indicating that the glucose now used for these mixtures is practicaly free from this constituent, which was formerly found in larger amounts.
7. Sulphur dioxide appeared, in a few cases, in classes of sirups not covered by the proviso of the food law that tolerates it, within certain limits and under certain conditions, in molasses.

8. In no case was saccharin, benzoic acid, or salicylic acid found present.

9. The labelling of many of these samples was open to objection, in that the indication of compound or mixed nature, the names of the ingredients of the mixtures, and the presence, in molasses, of sulphur dioxide, were often stated obscurely, and not plainly, in the position and size of type specified by law. Moreover, in mixture names, especially 'maple and cane', the less abundant ingredient was often made the more prominent, not simply by priority in order, but also by distinction in the typography used. In addition, some of the labels bore misleading statements or misleading devices. On the other hand, where weights of contents were stated, the quantities of contents corresponded closely thereto.

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Commonwealth of Pennsylvania.

DEPARTMENT OF AGRICULTURE

Bureau of Chemistry

BULLETIN NO. 225.

LINSEED OIL REPORT

1907-1911

JAMES W. KELLOGG,
Chief Chemist

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LETTER OF TRANSMITTAL

DEPARTMENT OF AGRICULTURE
BUREAU OF CHEMISTRY

Harrisburg, Pa., April 18, 1912.

Hon. N. B. Critchfield,
Secretary of Agriculture,
Harrisburg, Pa.

Dear Sir: I have the honor to transmit herewith a report of the linseed oil inspection work accomplished by this Bureau during the years 1907 to 1911 inclusive.

I respectfully recommend that this report be published in bulletin form.

Yours respectfully,
JAMES W. KELLOGG,
Chief Chemist.

BULLETIN No. 225.

LINSEED OIL REPORT

1907-1911

INTRODUCTION

The information herewith presented is a report of the linseed oil inspection work accomplished by the Bureau of Chemistry of the Pennsylvania Department of Agriculture and covers the samples received during the years 1907, 1908, 1909, 1910 and 1911. During this period this Bureau, under the direction of the Secretary of Agriculture, has had charge of the enforcement of the linseed oil law.

Heretofore no report of the linseed oil work has been published in bulletin form, but owing to the increasing number of inquiries concerning this work and because of the fact that the adulteration of this commodity still continues, it was thought advisable to prepare a bulletin which would give, briefly, some information concerning linseed oil and to endeavor to show what the Department has done in carrying out the provisions of the law regulating its sale.

During the five years covered by this report 814 samples were purchased by Special Agets of the Department from the dealers located in Pennsylvania. All of these samples were subjected to a chemical analysis. A few of the first samples received were analyzed by Mr. F. D. Fuller, formerly Chief Chemist of the Department, and the remaining number were analyzed by Mr. J. S. Spicer, who during a few weeks of a specially busy season, was assisted by Mr. M. H. Ulman.

Of the number of samples analyzed, 24 were found to be grossly adulterated, and 8 others were found to be below the standard for pure linseed oil. Two samples were found to contain mineral oil and were passed for the reason that they were not sold for pure oil. The principal adulterant used was found to be mineral oil, ranging in amounts from 1.00 per cent. to 24.00 per cent. A number of samples have been sent to the Department by those who became suspicious that the oil purchased was impure, which was found to contain from 20 per cent. to 30 per cent. of mineral oil.

It is greatly to be regretted that there are manufacturers still doing business whose unscrupulous methods in an effort to gain a dishonest profit lead them to offer adulterated linseed oil for sale in Pennsylvania. It has also been discovered that manufacturers whose reputation is above reproach have been taken advantage of by a few jobbers and dealers who have adulterated the pure product as shipped and have offered it for sale claiming it to be pure as originally received.

Purchasers of linseed oil are cautioned to make sure that they buy only from manufacturers whose reputation for manufacturing a pure product is well established. If possible, guarantees of purity should be obtained and the oil should be purchased in the original sealed barrels or containers. Dealers selling linseed oil should be careful not to use barrels, cans, or other forms of containers, which have previously been used for other oils or similar substances. Under no circumstances should measures be used for measuring out linseed oil which have previously been used for mineral oil, kerosene, petroleum, or other oils, as linseed oil drawn in such measures will be contaminated, especially if small quantities are sold.

The linseed oil industry is a very large and important one, and where adulterated oil is received instead of the pure article, a serious injustice is worked upon those who use it. The painters and the man whose buildings are painted with paint in which adulterated oil is used are defrauded. Steel construction work, as well as construction work of all sorts, painted with an impure product, is improperly protected, resulting, as is often well known, in serious loss or damage. Many cases may be cited where great harm and injustice is caused by the sale of adulterated linseed oil.

Our present appropriation is entirely inadequate at the present time to properly enforce the linseed oil law and to prevent the users of this product from being imposed upon. The present law, under which much has been accomplished, is not comprehensive enough to enable the Department to properly carry on this line of work, and it is hoped that in the near future a new law can be adopted and money enough appropriated to make it possible to prevent the sale of adulterated oil in Pennsylvania.

LINSEED OIL: ITS SOURCE, MANUFACTURE AND USE

Linseed oil is the oil which is pressed out of or extracted from the seed of the flax plant (Linum Usitatissium). Flax is chiefly grown in India, Russia, Argentine Republic, the United States and Canada. "The seed contains about 33 per cent. of oil, of which approximately 26 per cent. is, technically, extracted." A bushel of flaxseed, which weighs about 56 pounds, yields in the neighborhood of 2 gallons of oil. The oil is separated from the seed principally by two methods known as the "Old Process" and the "New Process."

In the "Old Process" the seeds are ground, heated and the oil pressed out by hydralic pressure. The remaining residue or cake is sold as a feeding stuff under the name of "Old Process Oil Meal."

In the "New Process" the seeds, after being ground, are placed in extraction cylinders and the oil leached out by a solvent which is afterwards recovered and used again in the process. The solvents which are used, according to the different extraction processes in use, are light petroleum, gasoline, carbon bisulphide, benzol, benzine or carbon tetra-chloride. The residue obtained from this method is sold as "New Process Oil Meal."

Linseed oil is known as a drying oil, and owing to its drying qualities which it possesses in a greater degree than most drying oils, and because it can be obtained in great abundance, it is particularily adapted and widely used in the manufacture of paints and varnishes. It is also used in the manufacture of linoleum, oil cloth, and printing inks. After the oil has been obtained from the seed it is purified or refined by filtering or chemical treatment, bleached or boiled, as the trade demands, and sold as raw or boiled linseed oil.

The drying properties of an oil are due to its power to absorb oxygen and upon drying to form a coating of great durability which will be imprevious and which will protect the surface coated with it from deterioration. Instead of losing weight from drying, linseed oil increases in weight by absorbing oxygen, and the greater the capacity to absorb oxygen, the sooner will its drying be completed. The drying qualities of linseed oil are increased by boiling and by the addition of dryers. Some of the dryers which are used are white lead, litharge, black oxide of manganese, rosin and resinates. These dryers are introduced in the dry or liquid form according to the methods in use by the different manufacturers. Boiled oil, or an oil to which dryers have been added, dry much faster than the raw oil and should dry in at least 24 hours. The time required for a raw oil to dry is from 2 to 8 days.

THE CHEMISTRY OF LINSEED OIL

Linseed oil is known by chemists as being a combination of glycerine with fatty acids of which linolic acid predominates. The glycerine acting as a base unites with linolic acid to form an oil in very much the same manner as an alkali (caustic soda or potash) unites with a mineral acid, such as muriatic acid (hydrochloric acid) to form a salt, as common salt (sodium chlorid). Such oils as linseed oil, poppy seed oil, rape seed oil and cotton seed oil can be made into soap by the addition of an alkali which will take the place of glycerine and unite with the fatty acids to form the substance known as soap. The process of substituting an alkali, such as caustic soda or caustic potash, for the glycerine in an oil is called "saponification." There is usually present in linseed oil a small amount of free fatty acids which are not combined with glycerine. The presence of an excessive amount of free fatty acids may be due to the oil becomming rancid or by its having been made from damaged seeds. Acidity may also be caused by the mineral acids used in refining, and by the addition of rosin and rosin oil. The amount of free acid contained in linseed oil can be determined, and this amount is known as its "acid value."

The analsis of linseed oil consists in making determinations of certain properties known as "constants." All oils have characteristic constants. In many oil these constants are very different from those of linseed oil. The constants usually determined in linseed oil analyses are as follows:

Specific Gravity. This constant is the weight or density of an oil at a given temperature as compared with water, and is determined by direct weighing or by the use of special instruments such as a hydrometer, or a Westphal balance.

Acid Value. The acid value, or test for acidity, is the amount of caustic potash required to neutralize the free acids and is determined and expressed as the number of milligrams of caustic potash required by one gram of oil,

Saponification Value (Koettstorfer number). This value or constant is the number of milligrams of caustic potash required to "saponify" one gram of oil, and it represents the amount of alkali necessary to convert one gram of oil into soap.

Unsaponifiable Matter. This constant represents the percentage amount of any substance which cannot be saponified or converted into soap. It is determined by saponifying the oil with an excess of caustic soda and extracting with a solvent and weighing. An excess of unsaponifiable matter indicates the presence of foreign oils, such as mineral oil and rosin oil.

Iodine Value (Hanus number). The iodine value of an oil is the percentage amount of iodine which it will absorb under certain conditions and is an index of its drying qualities. As has been previously stated, linseed oil dries by the absorption of oxygen, and as an oil will absorb iodine in much the same manner as it will absorb oxygen, it is made use of in the laboratory for the reason that it can be more easily used and because reliable and satisfactory results can be obtained.

LINSEEL OIL STANDARDS

From the knowledge gained from the analyses of a great number of oils by experienced analysts, certain constants or recognized standards of purity, for both raw and boiled linseed oil, have been adopted. The following are the constants which are recognized as being standards for boiled and raw linseed oil:

RAW LINSEED OIL.

Specific Gravity at 15.5° C. .9315 to .9360.
Acid Value not to exceed 6.
Saponification Value (Koettstorfer number) 187 to 195.
Unsaponifiable Matter not to exceed 1.5 per cent.
Iodine Value (Hanus number) 170 to 190.

BOILED LINSEED OIL.

Specific Gravity at 15.5° C. .9325 to .9450.
Acid Value not to exceed 10.
Saponification Value (Koettstorfer number) 185 to 195.
Unsaponifiable Matter not to exceed 2.00 per cent.
Iodine Value (Hanus number) 160 to 190.

Oil should be heated to a temperature of at least 107° Centegrade.

LINSEED OIL ADULTERANTS

According to market values and the readiness with which oils can be obtained, a number of these are used as adulterants. The following are a number of such products:

Mineral Oil,
Rosin Oil,
Rosin,
Fish Oil,
Turpentine,
Corn Oil,
Cotton Seed Oil,
Soya Bean Oil.

COPY OF LINSEED OIL LAW

For the information of those unfamiliar with the requirements of the linseed oil law now in force in Pennsylvania, a copy is herewith included, as follows:

AN ACT

No. 62

An act to prevent the adulteration of, and deception in the sale of, linseed or flaxseed oil.

Section 1. Be it enacted, &c., That no person, firm or corporation shall manufacture or mix for sale, sell or offer for sale, under the name of raw linseed oil, any article which is not wholly the product of commercially pure linseed or flaxseed. Nor shall any person, firm or corporation manufacture or mix for sale, sell or offer for sale, under the name of boiled linseed oil, any article unless the oil from which said article is made by wholly the product of commercially linseed or flaxseed, and unless the same has been heated to at least two hundred and twenty-five degrees, Fahrenheit.

Section 2. Nothing in this act shall be constructed as prohibiting the sale or manufacture of any compound of linseed or flaxseed oil: Provided, That such compound, if it imitates in appearance and is designed to take the place of linseed or flaxseed oil, shall not be manufactured or mixed for sale, sold or offered for sale, under the name or description containing the words "linseed oil" or "flaxseed oil."

Section 3. Any person, firm or corporation who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished for each and every such violation with a fine of not less than fifty dollars nor more than five hundred dollars, and, in default of the payment of such fine, shall be committed to the county jail for a period of not less than thirty days.

Section 4. It shall be the duty of the secretary of agriculture to enforce the provisions of this act. The said secretary and his assistants, experts and chemists, and others appointed by him, shall have access, ingress and egress to and from all places of business and buildings where linseed or flaxseed oil is kept for sale or stored. They shall also have the power and authority to open any tank, barrel, can or other vessel containing such oil, and may inspect the contents thereof and take samples therefrom for analysis.

Section 5. Any person, firm or corporation who shall violate any of the provisions of this act shall, in addition to the fines herein previously described for each offense, forfeit and pay a fixed penalty of one hundred dollars. Such penalty shall be recovered, with costs, in any court of the State having jurisdiction thereof, in an action to be prosecuted in the name of the people by the secretary of agriculture or by any of his assistants, and shall be devoted to the payment of the expenses of the department of said secretary. In any action commenced for the recovery of such penalties, an application may be made on the part of the plaintiff to a court of competent jurisdiction, or any judge thereof, for an injunction to restrain the defendant, his agents, servants and employes, from the further violation of this act during the pendency of the action; and it shall be the duty of such court, or judge, to grant the injunction, in the same manner as injunctions are usually granted under the rules and practice of such court, upon proof by affidavits that the defendant has been guilty of such violation either before or after the commencement of the action. In case the plaintiff shall recover judgment for the penalty or penalties demanded in the complaint, the judgment shall contain a permanent injunction restraining the defendant, his agents, servants and employes, from any further violation of the section or sections on which the recovery is obtained.

Approved—The 23d day of April, A. D. 1901.

WILLIAM A. STONE.

The foregoing is a true and correct copy of the act of the General Assembly No. 62.

W. W. GRIEST,
Secretary of the Commonwealth.

TABLE SHOWING RESULT OF INSPECTION

In the table which follows, the name and place of residence of the dealers from whom the samples of linseed oil were obtained, together with the name of the manufacturers where known, are given. In the column under "remarks" the word "passed" is used to designate the oils which have been passed by the Department as meeting the requirements, and the word "adulterated" designates those oils which failed to meet the standards for pure oil. As has been previously stated, the samples were secured during a five year period. In order to determine in what year a certain sample was obtained, the following explanation is given:

Nos. L1 to L141—1907.
Nos. L142 to L302—1908.
Nos. L303 to L519—1909.
Nos. L520 to L658—1910.
Nos. L659 to L814—1911.

RESULTS OF INSPECTION.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 669	Acme White Lead and Color Works, Pittsburg, Pa.,	Beaver Hardware Co., Beaver,	6	Raw,	Passed.
L 605	American Linseed Co., Buffalo, N. Y.,	H. R. Gilmore, Emlenton,	86	Raw,	Passed.
L 475	American Linseed Co., Baltimore, Md.,	Keystone Saddlery & Hdwe. Co., Carlisle,	173	Raw,	Passed.
L 635	American Linseed Oil Co., Cleveland, Ohio,	F. J. Eagen, Ridgway,	116	Raw,	Passed.
L 551	American Linseed Oil Co., Cleveland, Ohio,	A. J. Steele, Latrobe,	32	Raw,	Adulterated.
L 443	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Blymayer Hardware Co., Bedford,	141	Raw,	Passed.
L 397	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	S. E. Bowen, Ridgway,	95	Raw,	Passed.
L 419	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Dutton Hardware Co., Clearfield,	117	Raw,	Passed.
L 611	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	D. A. Gill, Meadville,	92	Boiled,	Passed.
L 433	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Grazier Bros. & Stine, Tyrone,	131	Raw,	Passed.
L 445	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	H. F. Gump & Sons, Everett,	143	Raw,	Passed.
L 398	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Hall, Kaul & Hyde Co., Ridgway,	96	Boiled,	Passed.
L 330	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	D. I. Heaps, Reedsville,	28	Raw,	Passed.
L 331	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Hoover Bros., Milroy,	29	Raw,	Passed.
L 782	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Horton & Macnab Co., New Castle,	2	Pure Raw,	Passed.
L 698	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	C. M. Irvin, Jersey Shore,	35	Raw,	Passed.
L 568	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Loucks Hardware Co., Scottdale,	49	Raw,	Passed.
L 578	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Lowman & Miller Hardware Co., Johnstown,	59	Raw,	Passed.
L 393	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	H. S. Loyd, Emporium,	91	Raw,	Passed.
L 667	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Geo. W. Martsolf, New Brighton,	4	Raw,	Passed.
L 631	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	T. E. Mayes, Renovo,	112	Boiled,	Passed.
L 602	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	James McCullough, Kittanning,	83	Raw,	Passed.
L 797	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	McKeesport Painters Supply, McKeesport,	12	Pure Raw,	Passed.
L 571	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Moser & Weltner, Uniontown,	52	Raw,	Passed.
L 417	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Moulthrop Bros., Du Bois,	115	Raw,	Passed.
L 753	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Moulthrop Bros., Du Bois,	90	Raw,	Passed.
L 627	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	John I. Olewine, Bellefonte,	108	Raw,	Passed.
L 641	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Pickett Hardware Co., Warren,	122	Boiled,	Passed.
L 418	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	William F. Powell, Clearfield,	116	Raw,	Passed.
L 587	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	L. S. W. Ray, Blairsville,	68	Raw,	Passed.
L 603	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Geo. L. Reiger, East Brady,	84	Raw,	Passed.
L 327	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	G. W. Sheary, Lewistown,	95	Raw,	Passed.

L 676	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	C. Ed. Smith, New Castle,	13	Boiled,	Passed.	
L 634	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Smith Bros. Co., Ridgway,	115	Boiled,	Passed.	
L 577	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Swank Hardware Co., Johnstown,	58	Raw,	Passed.	
L 569	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Lyons & Crow, Uniontown,	50	Raw,	Passed.	
L 615	Armstrong-McKelvey Lead and Oil Co., Pittsburg, Pa.,	Whitehill & Co., North East,	96	Boiled,	Passed.	
L 604	Archer Daniels Linseed Co., Minneapolis, Minn.,	V. Blatt, East Brady,	85	Raw,	Passed.	
L 572	Archer Daniels Linseed Co., Minneapolis, Minn.,	D. N. Craft & Sons, Uniontown,	53	Raw,	Passed.	
L 552	Archer Daniels Linseed Co., Minneapolis, Minn.,	Philip Doherty Hdwe. & Supply Co., Latrobe,	33	Raw,	Passed.	
L 733	Barker, Rose & Clinton Co., Elmira, N. Y.,	Beardsley & Colony, Troy,	70	Raw,	Passed.	
L 735	Barker, Rose & Clinton Co., Elmira, N. Y.,	Geo. D. Clark, Blossburg,	72	Raw,	Passed.	
L 731	Barker, Rose & Clinton Co., Elmira, N. Y.,	Lindley & Rowan, Canton,	68	Boiled,	Passed.	
L 783	Barker, Rose & Clinton Co., Elmira, N. Y.,	John L. Rockwell, Monroeton,	118	Raw,	Passed.	
L 354	Becker Glass and Paint Co., Buffalo, N. Y.,	Abbee & Seltz, Galeton,	52	Boiled,	Passed.	
L 346	Becker Glass and Paint Co., Buffalo, N. Y.,	J. A. Banks, Tioga,	44	Boiled,	Passed.	
L 359	Becker Glass and Paint Co., Buffalo, N. Y.,	Bard & Cheyney, Port Allegany,	57	Raw,	Passed.	
L 337	Becker Glass and Paint Co., Buffalo, N. Y.,	Dye & Bresee Hardware Co., Towanda,	35	Boiled,	Passed.	
L 751	Becker Glass and Paint Co., Buffalo, N. Y.,	W. B. Means, Smethport,	88	Raw,	Passed.	
L 741	Becker Glass and Paint Co., Buffalo, N. Y.,	W. H. Outman, Westfield,	78	Raw,	Passed.	
L 713	Lewis U. Bean Co., Philadelphia, Pa.,	C. L. Shipman, Hughesville,	50	Raw,	Passed.	
L 696	Bright & Company, Reading, Pa.,	H. Schmaltz, Kennett Square,	33	Raw,	Passed.	
L 472	Bright & Company, Reading, Pa.,	Nye & Conrad, Hummelstown,	170	Raw,	Passed.	
L 262	J. C. Bright & Co., Hazleton, Pa.,	J. Lindsay & Co., Freeland,	222	Boiled,	Passed.	
L 227	Bruen & Ritchey, New York,	Green's Pharmacy, Wilkes-Barre,	187	Raw,	Passed.	
L 298	Campbell & Thayer, New York, N. Y.,	Guinn Bros., Hawley,	258	Boiled,	Passed.	
L 497	James Corner & Sons, Baltimore, Md.,	N. H. Shearer & Co., York,	195	Raw,	Passed.	
L 701	H. B. Davis Company, Baltimore, Md.,	Beck Bros. & Co., Williamsport,	38	Raw,	Passed.	Constants low.
L 699	H. B. Davis Company, Baltimore, Md.,	Crowe & Stenner, Jersey Shore,	36	Raw,	Passed.	
L 695	H. B. Davis Company, Baltimore, Md.,	McCommon & Smith, Oxford,	32	Raw,	Passed.	
L 765	H. B. Davis Company, Baltimore, Md.,	W. T. Perkins, Plymouth,	102	Raw,	Passed.	
L 642	H. B. Davis Company, Baltimore, Md.,	Pickett Hardware Co., Warren,	123	Raw,	Passed.	
L 809	H. B. Davis Company, Baltimore, Md.,	R. P. Raymond, Middletown,	126	Raw,	Passed.	
L 810	H. B. Davis Company, Baltimore, Md.,	R. P. Raymond, Middletown,	127	Boiled,	Passed.	
L 789	H. B. Davis Company, Baltimore, Md.,	Reading Paint and Glass Co., Reading,	121	Raw,	Passed.	
L 757	H. B. Davis Company, Baltimore, Md.,	Geo. W. Sheary, Lewistown,	94	Raw,	Passed.	
L 657	H. B. Davis Company, Baltimore, Md.,	W. H. Straub, Milton,	138	Raw,	Passed.	
L 515	Paul J. Davis, Philadelphia, Pa.,	Altenderfer & Tyson, Lebanon,	213	Boiled,	Passed.	
L 705	Paul J. Davis, Philadelphia, Pa.,	Winner Bros., Williamsport,	42	Raw,	Passed.	
L 534	Dunlap, Slack & Co., Philadelphia, Pa.,	Hiram Wilson Hardware Store, Columbia,	15	Boiled,	Passed.	
L 788	Fehsenfeld Bros., Baltimore, Md.,	J. B. Holderbaum, Somerset,	5	Raw,	Passed.	
L 601	Fehsenfeld Bros., Baltimore, Md.,	H. G. Luker Co., Kittanning,	82	Raw,	Passed.	
L 457	Felton-Sibley & Co., Philadelphia, Pa.,	H. R. Durborow, Highspire,	155	Raw,	Passed.	
L 724	Felton-Sibley & Co., Philadelphia, Pa.,	J. B. Lewis & Co., Wyalusing,	61	Raw,	Passed.	
L 456	Felton-Sibley & Co., Philadelphia, Pa.,	R. P. Raymond, Middletown,	154	Raw,	Passed.	
L 804	Samuel H. French & Co., Philadelphia, Pa.,	Chas. H. Shive, Doylestown,	16	Raw,	Passed.	
L 509	Gilbert & Co., Baltimore, Md.,	Geo. H. Repman, York Haven,	207	Raw,	Passed.	Constants low.
L 662	W. J. Gilmore Drug Co., Pittsburg, Pa.,	E. James & Son, Ebensburg,	143	Raw,	Passed.	
L 580	W. J. Gilmore Drug Co., Pittsburg, Pa.	C. F. Kirkendall & Co., Johnstown,	61	Raw,	Passed.	

RESULTS OF INSPECTION—Continued.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 792	Globe Oil Company, Cleveland, Ohio,	North Side Furniture Co., South Sharon,	7	Raw,	Adulterated.
L 527	Grove Linseed Oil Co., Philadelphia, Pa.,	A. R. Bomberger, Lititz,	8	Raw,	Passed.
L 311	Grove Linseed Oil Co., Philadelphia, Pa.,	Boughner, Goodwill & Co., Shamokin,	9	Raw,	Passed.
L 459	Grove Linseed Oil Co., Philadelphia, Pa.,	C. L. Brinser & Son, Steelton,	157	Raw,	Passed.
L 690	Grove Linseed Oil Co., Philadelphia, Pa.,	Geo. L. Brown, Minersville,	27	Raw,	Passed.
L 542	Grove Linseed Oil Co., Philadelphia, Pa.,	J. A. Buckwalter, Royersford,	23	Raw,	Passed.
L 274	Grove Linseed Oil Co., Philadelphia, Pa.,	W. C. Cowles, Providence,	234	Raw,	Passed.
L 785	Grove Linseed Oil Co., Philadelphia, Pa.,	Walter Crawford, Nazareth,	119	Raw,	Passed.
L 530	Grove Linseed Oil Co., Philadelphia, Pa.,	Diller Hardware Co., New Holland,	11	Boiled,	Passed.
L 811	Grove Linseed Oil Co., Philadelphia, Pa.,	Geo. A. Fisher, Elizabethtown,	21	Raw,	Passed.
L 231	Grove Linseed Oil Co., Philadelphia, Pa.,	W. H. Frantz, Wilkes-Barre,	191	Boiled,	Passed.
L 504	Grove Linseed Oil Co., Philadelphia, Pa.,	Gettysburg Dept. Store, Gettysburg,	202	Boiled,	Passed.
L 506	Grove Linseed Oil Co., Philadelphia, Pa.,	Gilbert & Son, New Oxford,	204	Boiled,	Passed.
L 453	Grove Linseed Oil Co., Philadelphia, Pa.,	Henry Gilbert & Son, Harrisburg,	151	Boiled,	Passed.
L 532	Grove Linseed Oil Co., Philadelphia, Pa.,	A. B. Groff, New Holland,	13	Boiled,	Passed.
L 464	Grove Linseed Oil Co., Philadelphia, Pa.,	W. E. Keefer, Mechanicsburg,	162	Raw,	Passed.
L 526	Grove Linseed Oil Co., Philadelphia, Pa.,	C. H. Kreider, Lititz,	7	Raw,	Passed.
L 543	Grove Linseed Oil Co., Philadelphia, Pa.,	Milton Latshaw Hardware Co., Spring City,	24	Raw,	Passed.
L 538	Grove Linseed Oil Co., Philadelphia, Pa.,	Geo. H. Lewis & Son, Atglen,	19	Raw,	Passed.
L 524	Grove Linseed Oil Co., Philadelphia, Pa.,	W. Litzenberger, Manheim,	5	Raw,	Passed.
L 525	Grove Linseed Oil Co., Philadelphia, Pa.,	H. H. Martin, Manheim,	6	Raw,	Passed.
L 535	Grove Linseed Oil Co., Philadelphia, Pa.,	Miller Hardware Co., Marietta,	16	Raw,	Passed.
L 517	Grove Linseed Oil Co., Philadelphia, Pa.,	A. C. Ober, Palmyra,	215	Raw,	Passed.
L 521	Grove Linseed Oil Co., Philadelphia, Pa.,	Reilly Bros. & Raub, Lancaster,	2	Boiled,	Passed.
L 462	Grove Linseed Oil Co., Philadelphia, Pa.,	Jos. H. Rider & Son, Elizeabethtown,	160	Boiled,	Passed.
L 319	Grove Linseed Oil Co., Philadelphia, Pa.,	J. R. Schuyler, Bloomsburg,	17	Raw,	Passed.
L 496	Grove Linseed Oil Co., Philadelphia, Pa.,	P. A. & S. Small Co., York,	194	Boiled,	Passed.
L 529	Grove Linseed Oil Co., Philadelphia, Pa.,	I. G. Spreeher's Sons, Ephrata,	10	Boiled,	Passed.
L 292	Grove Linseed Oil Co., Philadelphia, Pa.,	Spring Brook Lumber Co., Moosic,	252	Raw,	Passed.
L 293	Grove Linseed Oil Co., Philadelphia, Pa.,	Spring Brook Lumber Co., Moosic,	253	Boiled,	Passed.
L 522	Grove Linseed Oil Co., Philadelphia, Pa.,	Steinman Hardware Co., Lancaster,	3	Boiled,	Passed.
L 448	Grove Linseed Oil Co., Philadelphia, Pa.,	O. F. Strayer, Harrisburg,	146	Raw,	Passed.
L 533	Grove Linseed Oil Co., Philadelphia, Pa.,	C. R. Strickler, Columbia,	14	Boiled,	Passed.

L 536	Grove Linseed Oil Co., Philadelphia, Pa.,	Stump & Muller, Marietta,	17	Raw,	Passed.
L 325	Grove Linseed Oil Co., Philadelphia, Pa.,	E. D. Tewksbury, Catawissa,	23	Raw,	Passed.
L 549	Grove Linseed Oil Co., Philadelphia, Pa.,	J. Evans Wright, Parkersburg,	30	Raw,	Adulterated.
L 499	Grove Linseed Oil Co., Philadelphia, Pa.,	York Paint and Color Co., York,	197	Boiled,	Passed.
L 401	Harrison Bros., Philadelphia, Pa.,	Kane Hardware and Stove Co., Kane,	99	Raw,	Passed.
L 434	Hauenstein & Bro., Buffalo, N. Y.,	Africa Bros., Huntingdon,	132	Raw,	Adulterated.
L 581	Hauenstein & Bro., Buffalo, N. Y.,	Africa Bros., Huntingdon,	62	Raw,	Passed.
L 291	Hauenstein & Bro., Bûffalo, N. Y.,	Durkin Bros., Taylor,	251	Raw,	Passed.
L 296	Hauenstein & Bro., Buffalo, N. Y.,	Erk Brothers, Honesdale,	256	Boiled,	Passed.
L 728	Hauenstein & Bro., Buffalo, N. Y.,	Finch Bros., Athens,	65	Boiled,	Passed.
L 790	Hauenstein & Bro., Buffalo, N. Y.,	Forney & Co., Altoona,	6	Pure O. P. Raw,	Passed.
L 242	Hauenstein & Bro., Buffalo, N. Y.,	Harry Lecher, Nanticoke,	202	Boiled,	Passed.
L 769	Hauenstein & Bro., Buffalo, N. Y.,	Max Ludwig, Pittston,	106	Raw,	Passed.
L 360	Hauenstein & Bro., Buffalo, N. Y.,	G. W. Proctor & Son, Lewisburg,	58	Boiled,	Passed.
L 693	Hauenstein & Bro., Buffalo, N. Y.,	Sausser Bros., Schuylkill,	30	Raw,	Passed.
L 365	Hauenstein & Bro., Buffalo, N. Y.,	W. H. Straub, Milton,	63	Raw,	Passed.
L 502	Hauenstein & Bro., Buffalo, N. Y.,	J. C. Tanger Co., Hanover,	200	Boiled,	Passed.
L 238	Hauenstein & Bro., Buffalo, N. Y.,	S. Townsend, Plymouth,	198	Boiled,	Passed.
L 297	Hauenstein & Bro., Buffalo, N. Y.,	Graham Watts, Honesdale,	257	Boiled,	Passed.
L 575	Frank Jefferies, Brownsville, Pa.,	Wolfe & Paul, Brownsville,	56	Raw,	Passed.
L 679	Johnston Bros., New Castle, Pa.,	H. S. Blatt Hardware Co., Elwood City,	16	Raw,	Passed. Constants low.
L 636	William Jones, Johnsonburg, Pa.,	C. M. Service, Johnsonburg,	117	Raw,	Passed.
L 670	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	Heckman Bros., Monaca,	7	Raw,	Passed.
L 564	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	Frank Huston, Connellsville,	45	Raw,	Passed.
L 471	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	Geo. W. Keller, New Bloomfield,	169	Raw,	Passed.
L 244	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	E. P. Kingsbury & Co., Nanticoke,	204	Boiled,	Passed.
L 373	Kellogg & McDougal Linseed Oil Works, Buffalo, N. Y.	Kline & Co., Williamsport,	71	Boiled,	Passed.
L 230	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	C. Morgan's Sons, Wilkes-Barre,	190	Boiled,	Passed.
L 236	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	William T. Perkins, Plymouth,	196	Raw,	Passed.
L 357	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	John Ryan & Co., Coudersport,	55	Raw,	Passed.
L 399	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	The Smith Hardware Co., Inc., Kane,	97	Raw,	Passed.
L 338	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	Spalding Hardware Co., Towanda,	36	Boiled,	Passed.
L 717	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	Wm. M. Spalding, Towanda,	54	Boiled,	Passed.
L 247	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	Thomas Trethaway, Parsons,	207	Raw,	Passed.
L 637	Kellogg & McDougall Linseed Oil Works, Buffalo, N. Y.	W. E. Zierden, Johnsonburg,	118	Boiled,	Passed.

RESULTS OF INSPECTION—Continued.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 658	Kellogg & Miller, Amsterdam, N. Y.,	John Y. Buoy, Milton,	139	Raw,	Passed.
L 768	Kellogg & Miller, Amsterdam, N. Y.,	Coursen Hardware Co., Pittston,	105	Raw,	Passed.
L 225	Kellogg & Miller, Amsterdam, N. Y.,	Phelps, Lewis & Bennett Co., Wilkes-Barre,	185	Boiled,	Passed.
L 241	Kellogg & Miller, Amsterdam, N. Y.,	A. J. Roat, Kingston,	201	Boiled,	Passed.
L 766	Kellogg & Miller, Amsterdam, N. Y.,	A. J. Roat Supply Co., Kingston,	103	Raw,	Passed.
L 286	Kellogg & Miller, Amsterdam, N. Y.,	Von Beck Bros., Carbondale,	246	Boiled,	Passed.
L 306	Kellogg & Miller, Amsterdam, N. Y.,	H. E. Walker, Northumberland,	4	Raw,	Passed.
L 493	Kellogg & Reed, Buffalo, N. Y.,	Beck & Benedict, Waynesboro,	191	Raw,	Passed.
L 744	Spencer Kellogg & Sons, Buffalo, N. Y.,	Abbee & Seltz Co., Galeton,	81	Raw,	Passed.
L 356	Spencer Kellogg & Sons, Buffalo, N. Y.,	C. C. Allen, Coudersport,	54	Raw,	Passed.
L 576	Spencer Kellogg & Sons, Buffalo, N. Y.,	J. D. Armstrong Drug Co., Brownsville,	57	Raw,	Passed.
L 352	Spencer Kellogg & Sons, Buffalo, N. Y.,	Bailey & Blair, Wellsboro,	50	Boiled,	Passed.
L 739	Spencer Kellogg & Sons, Buffalo, N. Y.,	R. W. Bailey & Son, Wellsboro,	76	Raw,	Passed.
L 745	Spencer Kellogg & Sons, Buffalo, N. Y.,	Barnes & Grabe, Coudersport,	82	Raw,	Passed.
L 342	Spencer Kellogg & Sons, Buffalo, N. Y.,	Beardsley & Colony, Troy,	40	Boiled,	Passed.
L 347	Spencer Kellogg & Sons, Buffalo, N. Y.,	Daniel Berry, Tioga,	45	Boiled,	Passed.
L 313	Spencer Kellogg & Sons, Buffalo, N. Y.,	S. E. Bergstresser & Co., Mt. Carmel,	11	Boiled,	Passed.
L 750	Spencer Kellogg & Sons, Buffalo, N. Y.,	Geo. A. Bodine Co., Bradford,	87	Raw,	Passed.
L 339	Spencer Kellogg & Sons, Buffalo, N. Y.,	Bolich Bros., Sayre,	37	Raw,	Passed.
L 726	Spencer Kellogg & Sons, Buffalo, N. Y.,	Bolich Bros., Sayre,	63	Boiled,	Passed.
L 322	Spencer Kellogg & Sons, Buffalo, N. Y.,	Brenner Hardware Co., Berwick,	20	Raw,	Passed.
L 688	Spencer Kellogg & Sons, Buffalo, N. Y.,	Bright & Co., Pottsville,	25	Boiled,	Passed.
L 259	Spencer Kellogg & Sons, Buffalo, N. Y.,	J. C. Bright & Co., Hazleton,	219	Boiled,	Passed.
L 370	Spencer Kellogg & Sons, Buffalo, N. Y.,	C. H. Bubb, Muncy,	68	Raw,	Passed.
L 732	Spencer Kellogg & Sons, Buffalo, N. Y.,	Carpenter & Pierce, Troy,	69	Boiled,	Passed.
L 539	Spencer Kellogg & Sons, Buffalo, N. Y.,	Christiana Hdwe. & Supply Co., Christiana,	20	Raw,	Passed.
L 449	Spencer Kellogg & Sons, Buffalo, N. Y.,	Cleckner & Burke, Harrisburg,	147	Raw,	Passed.
L 376	Spencer Kellogg & Sons, Buffalo, N. Y.,	James Cockburn, Newberry,	74	Raw,	Passed.
L 715	Spencer Kellogg & Sons, Buffalo, N. Y.,	Samuel Cole, Dushore,	52	Raw,	Passed.
L 333	Spencer Kellogg & Sons, Buffalo, N. Y.,	Cooley & Son, Montrose,	31	Boiled,	Passed.
L 722	Spencer Kellogg & Sons, Buffalo, N. Y.,	Cooley & Son, Montrose,	59	Raw,	Passed.
L 249	Spencer Kellogg & Sons, Buffalo, N. Y.,	Coursen Hardware Co., Pittston,	209	Boiled,	Passed.
L 594	Spencer Kellogg & Sons, Buffalo, N. Y.,	Culp Co., Vandergrift,	75	Raw,	Passed.

L 257	Spencer Kellogg & Sons, Buffalo, N. Y.,	Dallas Hardware Co., Dallas,	217	Raw,	Passed.
L 207	Spencer Kellogg & Sons, Buffalo, N. Y.,	Geo. Decker, Montgomery,	44	Raw,	Passed.
L 343	Spencer Kellogg & Sons, Buffalo, N. Y.,	John E. Dobbins, Troy,	41	Boiled,	Passed.
L 423	Spencer Kellogg & Sons, Buffalo, N. Y.,	Dougherty & Son, Altoona,	121	Raw,	Passed.
L 361	Spencer Kellogg & Sons, Buffalo, N. Y.,	C. Dreisbach's Sons, Lewisburg,	59	Boiled,	Passed.
L 798	Spencer Kellogg & Sons, Buffalo, N. Y.,	Drissel & Eberts, South Bethlehem,	123	Raw,	Passed.
L 681	Spencer Kellogg & Sons, Buffalo, N. Y.,	B. W. Dunbar, Evans City,	18	Raw,	Passed.
L 619	Spencer Kellogg & Sons, Buffalo, N. Y.,	Erie Hardware Co., Erie,	100	Boiled,	Passed.
L 802	Spencer Kellogg & Sons, Buffalo, N. Y.,	Erie Window Glass Co., Erie,	14	Raw,	Passed.
L 803	Spencer Kellogg & Sons, Buffalo, N. Y.,	Erie Window Glass Co., Erie,	15	Boiled,	Passed.
L 403	Spencer Kellogg & Sons, Buffalo, N. Y.,	Geo. C. Fayman Estate, Bradford,	101	Boiled,	Passed.
L 737	Spencer Kellogg & Sons, Buffalo, N. Y.,	W. S. Farrer, Mansfield,	74	Boiled,	Passed.
L 813	Spencer Kellogg & Sons, Buffalo, N. Y.,	F. G. Franciscus, Lewistown,	23	Gold Bond Raw,	Passed.
L 760	Spencer Kellogg & Sons, Buffalo, N. Y.,	W. H. Frantz, Wilkes-Barre,	97	Boiled,	Passed.
L 598	Spencer Kellogg & Sons, Buffalo, N. Y.,	Freeport Hardware Co., Freeport,	79	Raw,	Passed.
L 511	Spencer Kellogg & Sons, Buffalo, N. Y.,	S. R. Flury, Manchester,	209	Boiled,	Passed.
L 537	Spencer Kellogg & Sons, Buffalo, N. Y.,	Futhey & Swisher, Atglen,	18	Raw,	Passed.
L 353	Spencer Kellogg & Sons, Buffalo, N. Y.,	Gardner & Co., Wellsboro,	51	Boiled,	Passed.
L 358	Spencer Kellogg & Sons, Buffalo, N. Y.,	Gallup Hardware Co., Port Allegany,	56	Boiled,	Passed.
L 428	Spencer Kellogg & Sons, Buffalo, N. Y.,	W. H. Goodfellow's Sons, Hollidaysburg,	126	Raw,	Passed.
L 787	Spencer Kellogg & Sons, Buffalo, N. Y.,	W. H. Goodfellow's Sons, Altoona,	4	Gold Bond Raw,	Passed.
L 624	Spencer Kellogg & Sons, Buffalo, N. Y.,	E. E. Gignuon, Corry,	105	Boiled,	Passed.
L 305	Spencer Kellogg & Sons, Buffalo, N. Y.,	G. H. Hackett, Sunbury,	3	Boiled,	Passed.
L 452	Spencer Kellogg & Sons, Buffalo, N. Y.,	Harrisburg Hardware Co., Harrisburg,	150	Boiled,	Passed.
L 463	Spencer Kellogg & Sons, Buffalo, N. Y.,	Hauck Bros., Mechanicsburg,	161	Boiled,	Passed.
L 304	Spencer Kellogg & Sons, Buffalo, N. Y.,	P. O. Heim, Sunbury,	2	Raw,	Passed.
L 303	Spencer Kellogg & Sons, Buffalo, N. Y.,	W. H. Heim, Sunbury,	1	Boiled,	Passed.
L 307	Spencer Kellogg & Sons, Buffalo, N. Y.,	G. Hendricks & Son, Selinsgrove,	5	Raw,	Passed.
L 663	Spencer Kellogg & Sons, Buffalo, N. Y.,	C. J. Hogue, Cresson,	144	Raw,	Passed.
L 355	Spencer Kellogg & Sons, Buffalo, N. Y.,	William Horn, Galeton,	53	Boiled,	Passed.
L 702	Spencer Kellogg & Sons, Buffalo, N. Y.,	Kline & Co., Williamsport,	39	Boiled,	Passed.
L 492	Spencer Kellogg & Sons, Buffalo, N. Y.,	L. H. Leiter & Bro., Greencastle,	190	Raw,	Passed.
L 345	Spencer Kellogg & Sons, Buffalo, N. Y.,	Lindley & Rowan, Canton,	43	Boiled,	Passed.
L 561	Spencer Kellogg & Sons, Buffalo, N. Y.,	Geo. W. Lohr, Irwin,	42	Raw,	Passed.
L 458	Spencer Kellogg & Sons, Buffalo, N. Y.,	W. F. Maginnis, Steelton,	156	Raw,	Passed.
L 380	Spencer Kellogg & Sons, Buffalo, N. Y.,	J. J. Malong & Son, Hughesville,	78	Raw,	Passed.
L 265	Spencer Kellogg & Sons, Buffalo, N. Y.,	Mathews Bros., Scranton,	225	Boiled,	Passed.
L 498	Spencer Kellogg & Sons, Buffalo, N. Y.,	McClelland & Gotwalt Co., Ltd., York,	196	Boiled,	Passed.
L 446	Spencer Kellogg & Sons, Buffalo, N. Y.,	A. M. McClure, Everett,	144	Raw,	Passed.
L 483	Spencer Kellogg & Sons, Buffalo, N. Y.,	J. W. McPherson & Sons, Shippensburg,	181	Crystal Boiled,	Passed.
L 377	Spencer Kellogg & Sons, Buffalo, N. Y.,	Wm. Mendenhall, Montoursville,	75	Raw,	Passed.
L 644	Spencer Kellogg & Sons, Buffalo, N. Y.,	J. L. Meredith, Jr., West Chester,	125	Raw,	Passed.
L 518	Spencer Kellogg & Sons, Buffalo, N. Y.,	H. W. Miller, Annville,	216	Boiled,	Passed.
L 282	Spencer Kellogg & Sons, Buffalo, N. Y.,	Mills Bros., Carbondale,	242	Boiled,	Passed.
L 280	Spencer Kellogg & Sons, Buffalo, N. Y.,	F. W. Mills & Co., Jermyn,	240	Boiled,	Passed.
L 685	Spencer Kellogg & Sons, Buffalo, N. Y.,	L. G. Moore, Butler,	22	Boiled,	Passed.
L 721	Spencer Kellogg & Sons, Buffalo, N. Y.,	F. D. Morris & Co., Montrose,	58	Raw,	Passed.
L 465	Spencer Kellogg & Sons, Buffalo, N. Y.,	R. L. Nesbit & Co., Dillsburg,	163	Boiled,	Passed.
L 520	Spencer Kellogg & Sons, Buffalo, N. Y.,	H. S. Newcomer, Mt. Joy,	1	Boiled,	Passed.

RESULTS OF INSPECTION—Continued.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 264	Spencer Kellogg & Sons, Buffalo, N. Y.,	New Wall Paper Co., Scranton,	224	Boiled,	Passed.
L 371	Spencer Kellogg & Sons, Buffalo, N. Y.,	A. B. Neyhart, Williamsport,	69	Boiled,	Passed.
L 703	Spencer Kellogg & Sons, Buffalo, N. Y.,	Neyhart Hardware Co., Williamsport,	40	Raw,	Passed.
L 490	Spencer Kellogg & Sons, Buffalo, N. Y.,	Edgar W. Pensinger, Greencastle,	188	Raw,	Passed.
L 489	Spencer Kellogg & Sons, Buffalo, N. Y.,	W. S. Pentz, Greencastle,	187	Raw,	Passed.
L 718	Spencer Kellogg & Sons, Buffalo, N. Y.,	H. C. Porter & Son, Towanda,	55	Raw,	Passed.
L 548	Spencer Kellogg & Sons, Buffalo, N. Y.,	Pownall Hardware Co., Coatesville,	29	Raw,	Adulterated.*
L 697	Spencer Kellogg & Sons, Buffalo, N. Y.,	H. R. Pusey & Co., Avondale,	34	Raw,	Passed.
L 362	Spencer Kellogg & Sons, Buffalo, N. Y.,	Reber & Fisher, Lewisburg,	60	Raw,	Passed.
L 654	Spencer Kellogg & Sons, Buffalo, N. Y.,	J. F. Reber & Co., Lewisburg,	135	Raw,	Passed.
L 266	Spencer Kellogg & Sons, Buffalo, N. Y.,	C. A. Rehrig, Scranton,	226	Boiled,	Passed.
L 620	Spencer Kellogg & Sons, Buffalo, N. Y.,	John Reinhold, Jr., Erie,	101	Boiled,	Passed.
L 599	Spencer Kellogg & Sons, Buffalo, N. Y.,	E. J. Rihn, Ford City,	80	Raw,	Passed.
L 774	Spencer Kellogg & Sons, Buffalo, N. Y.,	Daniel Rinehart, Waynesboro,	111	Raw,	Passed.
L 773	Spencer Kellogg & Sons, Buffalo, N. Y.,	D. F. Ryder, Greencastle,	110	Raw,	Passed.
L 450	Spencer Kellogg & Sons, Buffalo, N. Y.,	The Ryder Hardware Store, Harrisburg,	148	Raw,	Passed.
L 395	Spencer Kellogg & Sons, Buffalo, N. Y.,	Schant Bros., St. Marys,	93	Boiled,	Passed.
L 614	Spencer Kellogg & Sons, Buffalo, N. Y.,	Selkregg Hardware Co., North East,	95	Boiled,	Passed.
L 786	Spencer Kellogg & Sons, Buffalo, N. Y.,	H. B. Semple & Sons, Easton,	120	Raw,	Passed.
L 364	Spencer Kellogg & Sons, Buffalo, N. Y.,	G. H. Shannon and Mills High, Watsontown,	62	Raw,	Passed.
L 487	Spencer Kellogg & Sons, Buffalo, N. Y.,	A. L. Sherk, Chambersburg,	185	Raw,	Passed.
L 772	Spencer Kellogg & Sons, Buffalo, N. Y.,	A. L. Sherk, Chambersburg,	109	Raw,	Passed.
L 501	Spencer Kellogg & Sons, Buffalo, N. Y.,	Samuel Shirk & Sons, Hanover,	199	Boiled,	Passed.
L 329	Spencer Kellogg & Sons, Buffalo, N. Y.,	D. H. Smucker, Belleville,	27	Raw,	Passed.
L 600	Spencer Kellogg & Sons, Buffalo, N. Y.,	W. J. Sturgeon, Kittanning,	81	Raw,	Passed.
L 645	Spencer Kellogg & Sons, Buffalo, N. Y.,	Sunbury Hardware Co., Sunbury,	126	Raw,	Passed.
L 687	Spencer Kellogg & Sons, Buffalo, N. Y.,	L. C. Thompson, Pottsville,	24	Raw,	Passed.
L 674	Spencer Kellogg & Sons, Buffalo, N. Y.,	Smith, Hutton & Kirk Co., New Castle,	11	Raw,	Passed.†
L 389	Spencer Kellogg & Sons, Buffalo, N. Y.,	Elmer Tevling, Mill Hall,	87	Raw,	Passed.
L 382	Spencer Kellogg & Sons, Buffalo, N. Y.,	Van Dyke & Co., Lock Haven,	80	Boiled,	Passed.

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*Sample contaminated by use of measure containing mineral oil. Responsibility assumed by dealer.

†Can of lard oil emptied by clerk into tank by mistake.

L 628	Spencer Kellogg & Sons, Buffalo, N. Y.,	Van Dyke Hardware Co., Lock Haven,	109	Boiled,	Passed.
L 692	Spencer Kellogg & Sons, Buffalo, N. Y.,	G. B. Wagner, Saint Clair,	29	Raw,	Passed.
L 794	Spencer Kellogg & Sons, Buffalo, N. Y.,	P. Wagner, Washington,	9	Pure Raw,	Passed.
L 648	Spencer Kellogg & Sons, Buffalo, N. Y.,	H. E. Walker, Northumberland,	129	Raw,	Passed.
L 314	Spencer Kellogg & Sons, Buffalo, N. Y.,	John Wardrop, Mt. Carmel,	12	Boiled,	Passed.
L 653	Spencer Kellogg & Sons, Buffalo, N. Y.,	John Wardrop, Mt. Carmel,	131	Raw,	Passed.
L 378	Spencer Kellogg & Sons, Buffalo, N. Y.,	Weaver Bros., Montoursville,	76	Boiled,	Passed.
L 709	Spencer Kellogg & Sons, Buffalo, N. Y.,	Weaver Bros., Montoursville,	46	Raw,	Passed.
L 528	Spencer Kellogg & Sons, Buffalo, N. Y.,	S. L. Weaver, Ephrata,	9	Boiled,	Passed.
L 223	Spencer Kellogg & Sons, Buffalo, N. Y.,	Weiss & Jones, Wilkes-Barre,	183	Boiled,	Passed.
L 316	Spencer Kellogg & Sons, Buffalo, N. Y.,	S. J. Welliver Sons Co., Danville,	14	Raw,	Passed.
L 512	Spencer Kellogg & Sons, Buffalo, N. Y.,	Geo. H. Wolf's Sons, Mt. Wolf,	210	Boiled,	Passed.
L 747	Spencer Kellogg & Sons, Buffalo, N. Y.,	J. C. Young, Eldred,	84	Boiled,	Passed.
L 661	Geo. A. Kelly Company, Pittsburg, Pa.,	K. A. Reed, Gallitzin,	142	Raw,	Passed.
L 655	Kline & Company, Williamsport, Pa.,	H. C. Hyatt, Lewisburg,	136	Raw,	Passed.
L 606	W. W. Lawrence Pittsburg, Pa.,	Franklin Hardware Co., Franklin,	87	Raw,	Passed.
L 562	W. W. Lawrence, Pittsburg, Pa.,	Shumaker, Ringer & Foster, Jeannette,	43	Raw,	Passed.
L 556	W. W. Lawrence, Pittsburg, Pa.,	Harry Thomas, Greensburg,	37	Raw,	Passed.
L 228	Lehn & Fink, New York,	Morris Greenstein, Wilkes-Barre,	188	Raw,	Passed.
L 541	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Acker & Fry, Phoenixville,	22	Raw,	Passed.
L 806	John T. Lewis & Bros. Co., Philadelphia, Pa.,	J. Irwin Ambler, Lansdale,	18	Raw,	Passed.
L 652	John T. Lewis & Bros. Co., Philadelphia, Pa.,	S. E. Bergstresser & Co., Mt. Carmel,	133	Raw,	Passed.
L 455	John T. Lewis & Bros. Co., Philadelphia, Pa.,	S. S. Brown, Middletown,	153	Raw,	Passed.
L 478	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Michael Burgard, Allen,	176	Raw,	Passed.
L 694	John T. Lewis & Bros. Co., Philadelphia, Pa.,	W. R. Clark, Oxford,	31	Raw,	Passed.
L 474	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Cochran & Alcock, Carlisle,	172	Raw,	Passed.
L 776	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Cochran & Alcock, Carlisle,	113	Raw,	Passed.
L 317	John T. Lewis & Bros. Co., Philadelphia, Pa.,	J. H. Cole, Danville,	15	Boiled,	Passed.
L 451	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Compton's Hardware Store, Harrisburg,	149	Raw,	Passed.
L 650	John T. Lewis & Bros. Co., Philadelphia, Pa.,	J. H. Conley & Sons, Shamokin,	131	Raw,	Passed.
L 466	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Creager & Co., Dillsburg,	164	Raw,	Passed.
L 807	John T. Lewis & Bros. Co., Philadelphia, Pa.,	J. C. Detwiler, Hatfield,	19	Raw,	Passed.
L 300	John T. Lewis & Bros. Co., Philadelphia, Pa.,	W. C. Drake, East Stroudsburg,	260	Raw,	Passed.
L 315	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Charles Fritz, Trevorton,	13	Raw,	Passed.
L 805	John T. Lewis & Bros. Co., Philadelphia, Pa.,	J. S. Geller, Lansdale,	17	Raw,	Passed.
L 546	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Griffith & Wollerton, East Downingtown,	27	Boiled,	Passed.
L 309	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Hack-Sanner Hardware Co., Shamokin,	7	Boiled,	Passed.
L 312	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Hack-Sanner Hardware Co., Mt. Carmel,	10	Boiled,	Passed.
L 651	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Hack-Sanner Hardware Co., Mt. Carmel,	132	Boiled,	Passed.
L 649	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Hack-Sanner Hardware Co., Shamokin,	130	Raw,	Passed.
L 647	John T. Lewis & Bros. Co., Philadelphia, Pa.,	W. H. Heim, Sunbury,	128	Raw,	Passed.
L 207	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Geo. Jiencke, Scranton,	227	Boiled,	Passed.
L 514	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Geo. Krause & Co., Lebanon,	212	Boiled,	Passed.
L 516	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Lebanon Hardware Co., Lebanon,	214	Boiled,	Passed.
L 725	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Lewis & Smith, Wyalusing,	62	Raw,	Passed.
L 320	John T. Lewis & Bros. Co., Philadelphia, Pa.,	W. McK. Reber, Bloomsburg,	18	Raw,	Passed.
L 762	John T. Lewis & Bros. Co., Philadelphia, Pa.,	C. Morgan's Sons, Wilkes-Barre,	99	Boiled,	Passed.
L 318	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Moyer Bros., Bloomsburg,	16	Boiled,	Passed.
L 763	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Phelps, Lewis & Bennett Co., Wilkes-Barre,	100	Raw,	Passed.

RESULTS OF INSPECTION—Continued.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 324	John T. Lewis & Bros. Co., Philadelphia, Pa.,	C. H. Schmick & Son, Catawissa,	22	Raw,	Passed.
L 800	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Pedel & Rouse, Lehighton,	125	Raw,	Passed.
L 531	John T. Lewis & Bros. Co., Philadelphia, Pa.,	J. W. Showalter, New Holland,	12	Boiled,	Passed.
L 686	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Swalm Hardware Co., Pottsville,	23	Raw,	Passed.
L 764	John T. Lewis & Bros. Co., Philadelphia, Pa.,	S. Townsend, Plymouth,	101	Raw,	Passed.
L 477	John T. Lewis & Bros. Co., Philadelphia, Pa.,	Wagner Hardware Co., Carlisle,	175	Raw,	Passed.
L 484	John T. Lewis & Bros. Co., Philadelphia, Pa.,	G. F. Walters & Sons, Shippensburg,	182	Raw,	Passed.
L 791	John T. Lewis & Bros. Co., Philadelphia, Pa.,	G. F. Walters & Sons, Shippensburg,	122	Raw,	Passed.
L 759	John T. Lewis & Bros. Co., Philadelphia, Pa.,	White Hardware Co., Wilkes-Barre,	96	Raw,	Passed.
L 519	John T. Lewis & Bros. Co., Philadelphia, Pa.,	J. H. Wilhelm, Myerstown,	217	Raw,	Passed.
L 540	Loos & Dillworth, Philadelphia, Pa.,	N. H. Benjamin Co., Phoenixville,	21	Boiled,	Passed.
L 470	John Lucas & Co., Philadelphia, Pa.,	Clouser & Gilliland, New Bloomfield,	168	Raw,	Passed.
L 747	John Lucas & Co., Philadelphia, Pa.,	Eichelberger & Sons, Saxton,	145	Raw,	Passed.
L 444	John Lucas & Co., Philadelphia, Pa.,	E. D. Heckerman, Bedford,	142	Raw,	Passed.
L 256	John Lucas & Co., Philadelphia, Pa.,	J. T. Snyder, Luzerne,	216	Boiled,	Passed.
L 469	John Lucas & Co., Philadelphia, Pa.,	J. Y. Wills & Son, Duncannon,	167	Raw,	Passed.
L 468	John Lucas & Co., Philadelphia, Pa.,	H. B. Wilson, Newport,	166	Boiled,	Passed.
L 277	Maloney Oil & Mfg. Co., Scranton, Pa.,	W. F. Bishop, Archbald,	237	Boiled,	Passed.
L 276	Maloney Oil & Mfg. Co., Scranton, Pa.,	T. J. O. Boyle, Archbald,	236	Raw,	Passed.
L 269	Maloney Oil & Mfg. Co., Scranton, Pa.,	J. E. Johns, Hyde Park,	229	Boiled,	Passed.
L 281	Maloney Oil & Mfg. Co., Scranton, Pa.,	J. W. Patten, Olyphant,	241	Boiled,	Passed.
L 625	The Mann Bros. Co., Buffalo, N. Y.,	The Barlow Hardware Co., Corry,	106	Boiled,	Passed.
L 250	The Mann Bros. Co., Buffalo, N. Y.,	W. S. Barritt, Pittston,	210	Raw,	Passed.
L 285	The Mann Bros. Co., Buffalo, N. Y.,	F. A. Bell and F. G. Brown, Carbondale,	245	Raw,	Passed.
L 738	The Mann Bros. Co., Buffalo, N. Y.,	Dan Berry, Tioga,	75	Raw,	Passed.
L 335	The Mann Bros. Co., Buffalo, N. Y.,	Paul Billings & Sons, Tunkhannock,	33	Raw,	Passed.
L 719	The Mann Bros. Co., Buffalo, N. Y.,	Paul Billings & Sons, Tunkhannock,	56	Raw,	Passed.
L 476	The Mann Bros. Co., Buffalo, N. Y.,	J. P. Bixler & Sons, Carlisle,	174	Boiled,	Passed.
L 407	The Mann Bros. Co., Buffalo, N. Y.,	Geo. A. Bodine Co., Bradford,	105	Boiled,	Passed.
L 461	The Mann Bros. Co., Buffalo, N. Y.,	Geo. D. Boggs & Son, Elizabethtown,	159	Boiled,	Passed.
L 812	The Mann Bros. Co., Buffalo, N. Y.,	Geo. D. Boggs & Son, Elizabethtown,	22	Boiled,	Passed.
L 414	The Mann Bros. Co., Buffalo, N. Y.,	Bond & Cooper, Brockwayville,	112	Raw,	Passed.
L 495	The Mann Bros. Co., Buffalo, N. Y.,	J. A. Boyd, Mercersburg,	193	Raw,	Passed.

L 334	The Mann Bros. Co., Buffalo, N. Y.,	A. B. Burns' Sons, Montrose,	32	Boiled,	Passed.
L 383	The Mann Bros. Co., Buffalo, N. Y.,	A. C. Candor & Co., Lock Haven,	81	Raw,	Passed.
L 629	The Mann Bros. Co., Buffalo, N. Y.,	A. C. Candor & Co., Lock Haven,	110	Boiled,	Passed.
L 341	The Mann Bros. Co., Buffalo, N. Y.,	Carpenter & Pierce, Troy,	39	Boiled,	Passed.
L 349	The Mann Bros. Co., Buffalo, N. Y.,	Geo. D. Clark, Blossburg,	47	Boiled,	Passed.
L 308	The Mann Bros. Co., Buffalo, N. Y.,	J. H. Conley & Sons, Shamokin,	6	Boiled,	Passed.
L 714	The Mann Bros. Co., Buffalo, N. Y.,	J. Cunningham, Dushore,	51	Raw,	Passed.
L 752	The Mann Bros. Co., Buffalo, N. Y.,	Daly & Garlick, Smethport,	89	Boiled,	Passed.
L 671	The Mann Bros. Co., Buffalo, N. Y.,	Dickson & Co., New Castle,	8	Raw,	Passed.
L 321	The Mann Bros. Co., Buffalo, N. Y.,	T. Harvey Doon, Berwick,	19	Raw,	Passed.
L 488	The Mann Bros. Co., Buffalo, N. Y.,	Eckel & Brand, Chambersburg,	186	Raw,	Passed.
L 567	The Mann Bros. Co., Buffalo, N. Y.,	Eicher & Graft, Scottdale,	48	Raw,	Passed.
L 405	The Mann Bros. Co., Buffalo, N. Y.,	Emery Hardware Co., Bradford,	103	Boiled,	Passed.
L 748	The Mann Bros. Co., Buffalo, N. Y.,	Emery Hardware Co., Bradford,	85	Boiled,	Passed.
L 617	The Mann Bros. Co., Buffalo, N. Y.,	Erie Window Glass Co., Erie,	98	Boiled,	Passed.
L 302	The Mann Bros. Co., Buffalo, N. Y.,	Steward Flagler, Stroudsburg,	262	Raw,	Passed.
L 363	The Mann Bros. Co., Buffalo, N. Y.,	Follmer & Wilson, Watsontown,	61	Raw,	Passed.
L 404	The Mann Bros. Co., Buffalo, N. Y.,	J. B. Fox, Bradford,	102	Boiled,	Passed.
L 431	The Mann Bros. Co., Buffalo, N. Y.,	Franciscus Hardware Co., Tyrone,	129	Raw,	Passed.
L 758	The Mann Bros. Co., Buffalo, N. Y.,	F. G. Franciscus, Lewistown,	95	Raw,	Passed.
L 384	The Mann Bros. Co., Buffalo, N. Y.,	J. H. Fredericks & Bro., Lock Haven,	82	Boiled,	Passed.
L 630	The Mann Bros. Co., Buffalo, N. Y.,	J. H. Fredericks & Bro., Lock Haven,	111	Boiled,	Passed.
L 379	The Mann Bros. Co., Buffalo, N. Y.,	M. Gillis, Hughesville,	77	Raw,	Passed.
L 711	The Mann Bros. Co., Buffalo, N. Y.,	M. Gillis, Hughesville,	48	Raw,	Passed.
L 480	The Mann Bros. Co., Buffalo, N. Y.,	Graham & Fietz, Newville,	178	Raw,	Passed.
L 777	The Mann Bros. Co., Buffalo, N. Y.,	Graham & Fietz, Newville,	114	Raw,	Passed.
L 633	The Mann Bros. Co., Buffalo, N. Y.,	Hall, Kaul & Hyde Co., St. Marys,	114	Boiled,	Passed.
L 610	The Mann Bros. Co., Buffalo, N. Y.,	Hartman & Judd, Meadville,	91	Boiled,	Passed.
L 409	The Mann Bros. Co., Buffalo, N. Y.,	John E. Hamlin, Smethport,	107	Raw,	Passed.
L 410	The Mann Bros. Co., Buffalo, N. Y.,	John E. Hamlin, Smethport,	108	Boiled,	Passed.
L 243	The Mann Bros. Co., Buffalo, N. Y.,	Hill & Evans, Nanticoke,	203	Boiled,	Passed.
L 584	The Mann Bros. Co., Buffalo, N. Y.,	Indiana Hardware Co., Indiana,	65	Raw,	Passed.
L 781	The Mann Bros. Co., Buffalo, N. Y.,	Indiana Hardware Co., Indiana,	1	Raw,	Passed.
L 427	The Mann Bros. Co., Buffalo, N. Y.,	C. B. Jacobs' Son & Co., Hollidaysburg,	125	Raw,	Passed.
L 295	The Mann Bros. Co., Buffalo, N. Y.,	C. C. Jadwin, Honesdale,	255	Boiled,	Passed.
L 240	The Mann Bros. Co., Buffalo, N. Y.,	Jenkins Hardware Co., Edwardsville,	200	Boiled,	Passed.
L 422	The Mann Bros. Co., Buffalo, N. Y.,	Jones & Co., Philipsburg,	120	Raw,	Passed.
L 491	The Mann Bros. Co., Buffalo, N. Y.,	D. B. Keefer & Co., Greencastle,	189	Boiled,	Passed.
L 585	The Mann Bros. Co., Buffalo, N. Y.,	Keller Bros., Indiana,	66	Raw,	Passed.
L 742	The Mann Bros. Co., Buffalo, N. Y.,	F. E. Kinsman, Westfield,	79	Raw,	Passed.
L 523	The Mann Bros. Co., Buffalo, N. Y.,	Lanc. Fire Proofing and Paint Co., Lancaster,	4	Raw,	Passed.
L 374	The Mann Bros. Co., Buffalo, N. Y.,	J. H. Link, Williamsport,	72	Boiled,	Passed.
L 263	The Mann Bros. Co., Buffalo, N. Y.,	W. E. Martin, Freeland,	223	Raw,	Passed.
L 391	The Mann Bros. Co., Buffalo, N. Y.,	H. F. McFarland, Renovo,	89	Boiled,	Passed.
L 632	The Mann Bros. Co., Buffalo, N. Y.,	H. F. McFarland, Renovo,	113	Boiled,	Passed.
L 385	The Mann Bros. Co., Buffalo, N. Y.,	H. D. Meek Hardware Co., State College,	83	Raw,	Passed.
L 621	The Mann Bros. Co., Buffalo, N. Y.,	Gus J. Miller, Erie,	102	Boiled,	Passed.
L 616	The Mann Bros. Co., Buffalo, N. Y.,	Palace Hardware House, Erie,	97	Boiled,	Passed.
L 278	The Mann Bros. Co., Buffalo, N. Y.,	The Peck Lumber Mfg. Co., Peckville,	238	Boiled,	Passed.

RESULTS OF INSPECTION—Continued.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 344	The Mann Bros. Co., Buffalo, N. Y.,	Theodore Pierce, Canton,	42	Raw,	Passed.
L 438	The Mann Bros. Co., Buffalo, N. Y.,	Punxsutawney Hardware Co., Punxsutawney,	136	Boiled,	Passed.
L 684	The Mann Bros. Co., Buffalo, N. Y.,	Redick & Grohman, Butler,	21	Raw,	Passed.
L 740	The Mann Bros. Co., Buffalo, N. Y.,	Chas. H. Roberts, Wellsboro,	77	Raw,	Passed.
L 729	The Mann Bros. Co., Buffalo, N. Y.,	Geo. L. Roberts Co., Athens,	66	Boiled,	Passed.
L 340	The Mann Bros. Co., Buffalo, N. Y.,	Geo. L. Roberts Co., Sayre,	38	Boiled,	Passed.
L 727	The Mann Bros. Co., Buffalo, N. Y.,	Geo. L. Roberts Co., Sayre,	64	Boiled,	Passed.
L 351	The Mann Bros. Co., Buffalo, N. Y.,	Roberts Hardware Co., Wellsboro,	49	Raw,	Passed.
L 332	The Mann Bros. Co., Buffalo, N. Y.,	J. J. Ryan Co., Montrose,	30	Boiled,	Passed.
L 723	The Mann Bros. Co., Buffalo, N. Y.,	J. J. Ryan Co., Montrose,	60	Boiled,	Passed.
L 689	The Mann Bros. Co., Buffalo, N. Y.,	F. W. Sanner Hardware Co., Minersville,	26	Raw,	Passed.
L 607	The Mann Bros. Co., Buffalo, N. Y.,	Schultz & Pardoe, Franklin,	88	Raw,	Passed.
L 326	The Mann Bros. Co., Buffalo, N. Y.,	J. B. Selheimer, Lewistown,	24	Boiled,	Passed.
L 756	The Mann Bros. Co., Buffalo, N. Y.,	J. B. Selheimer, Lewistown,	93	Boiled,	Passed.
L 814	The Mann Bros. Co., Buffalo, N. Y.,	J. B. Selheimer, Lewistown,	24	Raw,	Passed.
L 640	The Mann Bros. Co., Buffalo, N. Y.,	T. O. Slater & Co., Warren,	121	Boiled,	Passed.
L 392	The Mann Bros. Co., Buffalo, N. Y.,	Stephens Hardware Co., Emporium,	90	Raw,	Passed.
L 348	The Mann Bros. Co., Buffalo, N. Y.,	Strait & Retan, Mansfield,	46	Boiled,	Passed.
L 736	The Mann Bros. Co., Buffalo, N. Y.,	Strait & Retan, Mansfield,	73	Boiled,	Passed.
L 771	The Mann Bros. Co., Buffalo, N. Y.,	Susquehanna Lumber Co., Nanticoke,	108	Boiled,	Passed.
L 390	The Mann Bros. Co., Buffalo, N. Y.,	Swain Drug Co., Renovo,	88	Boiled,	Passed.
L 749	The Mann Bros. Co., Buffalo, N. Y.,	Thompson & Wood, Bradford,	86	Raw,	Passed.
L 235	The Mann Bros. Co., Buffalo, N. Y.,	Chas. W. Vincent, Ashley,	195	Raw,	Passed.
L 626	The Mann Bros. Co., Buffalo, N. Y.,	Wales Hardware Co., Corry,	107	Raw,	Passed.
L 328	The Mann Bros. Co., Buffalo, N. Y.,	Samuel Watts, Belleville,	26	Raw,	Passed.
L 224	The Mann Bros. Co., Buffalo, N. Y.,	White Hardware Co., Wilkes-Barre,	184	Boiled,	Passed.
L 336	The Mann Bros. Co., Buffalo, N. Y.,	Williams Hardware Co., Tunkhannock,	34	Raw,	Passed.
L 720	The Mann Bros. Co., Buffalo, N. Y.,	Williams Hardware Co., Tunkhannock,	57	Raw,	Passed.
L 381	The Mann Bros. Co., Buffalo, N. Y.,	W. L. Wilson, Jersey Shore,	79	Raw,	Passed.
L 700	The Mann Bros. Co., Buffalo, N. Y.,	W. L. Wilson, Jersey Shore,	37	Raw,	Passed.
L 426	The Mann Bros. Co., Buffalo, N. Y.,	S. J. Wolf Hardware Co., Altoona,	124	Raw,	Passed.
L 730	The Mann Bros. Co., Buffalo, N. Y.,	Wynnee Bros., Canton,	67	Raw,	Passed.
L 270	Matthews Bros., Scranton, Pa.,	J. G. Bone & Son, Dunmore,	230	Boiled.	Passed.

L 283	Matthews Bros., Scranton, Pa.,	H. F. Clark, Carbondale,	243	Raw,	Passed.	
L 268	Matthews Bros., Scranton, Pa.,	W. R. Dawes, Hyde Park,	228	Boiled,	Passed.	
L 272	Matthews Bros., Scranton, Pa.,	H. E. Griffin and T. B. Evans, Providence,	232	Raw,	Passed.	
L 503	Metzer Seed and Oil Co., Toledo, Ohio,	J. H. Colliflower, Gettysburg,	201	Boiled,	Passed.	Constants low.
L 659	Metzer Seed and Oil Co., Toledo, Ohio,	E. F. Maeder, Juniata,	140	Raw,	Passed.	
L 677	Midland Linseed Co., Minneapolis, Minn.,	Sample Hardware Co., New Castle,	14	Raw,	Passed.	
L 795	C. H. Miller Hardware Co., Huntingdon, Pa.,	D. C. Kutz & Son, Orbisonia,	10	Raw,	Passed.	
L 284	Mills Brothers, Carbondale, Pa.,	A. W. Reynolds, Carbondale,	244	Raw,	Passed.	
L 494	Milwaukee Linseed Oil Works, Milwaukee, Wis.,	Daniel Rinehart, Waynesboro,	192	Raw,	Passed.	
L 245	C. Morgan's Sons, Wilkes-Barre, Pa.,	A. Baicker, Nanticoke,	205	Raw,	Passed.	
L 226	C. Morgan's Sons, Wilkes-Barre, Pa.,	B. G. Carpenter & Co., Wilkes-Barre,	186	Raw,	Passed.	
L 254	C. Morgan's Sons, Wilkes-Barre, Pa.,	Lewis Pharmacy, Forty Fort,	214	Raw,	Passed.	
L 234	C. Morgan's Sons, Wilkes-Barre, Pa.,	W. A. Waite, Sugar Notch,	194	Raw,	Passed.	
L 712	Moyer Brothers, Bloomsburg, Pa.,	A. S. Michael & Co., Hughesville,	49	Raw,	Passed.	
L 716	National Lead Company, New York, N. Y.,	Dye & Bresee Hardware Co., Towanda,	53	Raw,	Passed.	
L 372	National Lead and Oil Co., Pittsburg, Pa.,	Beck Bros. & Co., Williamsport,	70	Boiled,	Passed.	
L 440	National Lead and Oil Co., Pittsburg, Pa.,	Brown Hardware Co., Punxsutawney,	138	Raw,	Passed.	
L 388	National Lead and Oil Co., Pittsburg, Pa.,	E. J. Eckenroth, Bellefonte,	86	Boiled,	Passed.	
L 394	National Lead and Oil Co., Pittsburg, Pa.,	Hall, Kaull & Hyde Co., St. Marys,	92	Boiled,	Passed.	
L 415	National Lead and Oil Co., Pittsburg, Pa.,	Hilner-Hoover Hardware Co., Du Bois,	113	Boiled,	Passed.	
L 754	National Lead and Oil Co., Pittsburg, Pa.,	Hilner-Hoover Hardware Co., Du Bois,	91	Raw,	Passed.	
L 400	National Lead and Oil Co., Pittsburg, Pa.,	J. D. Magowan, Kane,	98	Boiled,	Passed.	
L 638	National Lead and Oil Co., Pittsburg, Pa.,	J. D. Magowan, Kane,	119	Boiled,	Passed.	
L 796	National Lead and Oil Co., Pittsburg, Pa.,	A. M. McClure, Everett,	11	Raw,	Passed.	
L 555	National Lead and Oil Co., Pittsburg, Pa.,	A. B. Myers & Son, Ligonier,	36	Raw,	Passed.	
L 386	National Lead and Oil Co., Pittsburg, Pa.,	John I. Olewine, Bellefonte,	84	Raw,	Passed.	
L 416	National Lead and Oil Co., Pittsburg, Pa.,	Prothero, Bailey & Goodwin, Du Bois,	114	Raw,	Passed.	
L 755	National Lead and Oil Co., Pittsburg, Pa.,	Prothero, Bailey & Goodwin, Du Bois,	92	Raw,	Passed.	
L 608	National Lead and Oil Co., Pittsburg, Pa.,	Martin W. Riesman, Franklin,	89	Raw,	Passed.	
L 441	National Lead and Oil Co., Pittsburg, Pa.,	Wm. J. Sheavly, Hyndman,	139	Raw,	Passed.	
L 437	National Lead and Oil Co., Pittsburg, Pa.,	E. M. Swope, Petersburg,	135	Raw,	Passed.	
L 406	National Lead and Oil Co., Pittsburg, Pa.,	Thompson & Wood, Bradford,	104	Boiled,	Passed.	
L 675	National Lead and Oil Co., Pittsburg, Pa.,	The Welch Hardware Co., New Castle,	12	Boiled,	Passed.	
L 424	National Lead and Oil Co., Pittsburg, Pa.,	A. R. Wolf Hardware Co., Altoona,	122	Raw,	Passed.	
L 579	Nevin & Company, Pittsburg, Pa.,	Fenn's Hardware Store, Johnstown,	60	Raw,	Passed.	
L 799	Penna. Alcohol and Chemical Co., Philadelphia, Pa.,	Wm. A. Fritzinger, Slatington,	124	Raw,	Passed.	
L 229	Phoenix Paint and Varnish Co., Philadelphia, Pa.,	Thomas D. Williams, Wilkes-Barre,	189	Boiled,	Passed.	
L 570	Pittsburg Plate Glass Co., Pittsburg, Pa.,	S. S. Auslander, Uniontown,	51	Raw,	Passed.	
L 563	Pittsburg Plate Glass Co., Pittsburg, Pa.,	Gaut & Baker, Jeannette,	44	Raw,	Passed.	
L 485	Pittsburg Plate Glass Co., Pittsburg, Pa.,	N. O. Huber, Chambersburg,	183	Raw,	Passed.	
L 396	Pittsburg Plate Glass Co., Pittsburg, Pa.,	Smith Bros. Co., Ridgway,	94	Boiled,	Passed.	
L 486	Pittsburg Plate Glass Co., Pittsburg, Pa.,	A. L. Solenberger, Chambersburg,	184	Raw,	Passed.	
L 287	Pittsburg Plate Glass Co., Philadelphia, Pa.,	L. Baltimore, Duryea,	247	Raw,	Passed.	
L 275	Pittsburg Plate Glass Co., Philadelphia, Pa.,	C. W. Benamin, Dickson City,	235	Raw,	Passed.	
L 473	Pittsburg Plate Glass Co., Philadelphia, Pa.,	J. M. Brightbill, Hummelstown,	171	Raw,	Passed.	
L 290	Pittsburg Plate Glass Co., Philadelphia, Pa.,	Ignatz Brown, Old Forge,	250	Raw,	Passed.	
L 547	Pittsburg Plate Glass Co., Philadelphia, Pa.,	Coatesville Hardware Co., Coatesville,	28	Raw,	Passed.	
L 706	Pittsburg Plate Glass Co., Philadelphia, Pa.,	W. E. Frey, Montgomery,	43	Raw.	Adulterated.	

RESULTS OF INSPECTION—Continued.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 770	Pittsburg Plate Glass Co., Philadelphia, Pa.,	E. W. Larish, Wyoming,	107	Raw,	Passed.
L 253	Pittsburg Plate Glass Co., Philadelphia, Pa.,	A. W. Shoemaker, Wyoming,	213	Raw,	Passed.
L 299	Pittsburg Plate Glass Co., Philadelphia, Pa.,	Graham Watts & Son, Hawley,	259	Boiled,	Passed.
L 643	John D. S. Potts, Philadelphia, Pa.,	Palmer & Clayton, West Chester,	124	Raw,	Passed.
L 691	Pottsville Supply Co., Pottsville, Pa.,	E. & R. Oestreich, St. Clair,	28	Raw,	Passed.
L 367	Reber & Fisher, Lewisburg, Pa.,	Union Hardware Co., Mifflinburg,	65	Boiled,	Passed.
L 557	The Sherwin-Williams Co., Cleveland, Ohio,	D. W. Bortz, Greensburg,	38	Raw,	Passed.
L 618	The Sherwin-Williams Co., Cleveland, Ohio,	Erie Paint Co., Erie,	99	Boiled,	Passed.
L 442	The Sherwin-Williams Co., Cleveland, Ohio,	W. H. Kramer, Hyndman,	140	Raw,	Passed.
L 596	The Sherwin-Williams Co., Cleveland, Ohio,	W. F. Pauly, Apollo,	77	Raw,	Passed.
L 323	The Sherwin-Williams Co., Newark, N. J.,	Berwick Store Co., Ltd., Berwick,	21	Raw,	Passed.
L 460	The Sherwin-Williams Co., Newark, N. J.,	Geo. A. Fisher, Elizabethtown,	158	Raw,	Passed.
L 294	The Sherwin-Williams Co., Newark, N. J.,	O. M. Spettigue, Honesdale,	254	Boiled,	Passed.
L 366	The Sherwin-Williams Co., Newark, N. J.,	J. C. Steans, Mifflinburg,	64	Raw,	Passed.
L 775	The Sherwin-Williams Co., Philadelphia, Pa.,	J. W. McPherson & Sons, Shippensburg,	112	Raw.	Passed.
L 375	The Sherwin-Williams Co., Philadelphia, Pa.,	Webster Hardware Co., Newberry,	73	Raw,	Passed.
L 507	Shoemaker & Busch, Philadelphia, Pa.,	I. M. Anspach, York Haven,	205	Raw,	Passed.
L 261	Shoemaker & Busch, Philadelphia, Pa.,	Wm. Birkbeck, Freeland.	221	Raw,	Passed.
L 221	Robert Shoemaker & Co., Philadelphia, Pa.,	Frank & Barber, Wilkes-Barre,	181	Boiled,	Passed.
L 482	Robert Shoemaker & Co., Philadelphia, Pa.,	S. W. Lehman, Shippensburg,	180	Raw,	Passed.
L 510	P. A. & S. Small Company, York, Pa.,	S. S. Bare, Manchester,	208	Boiled,	Passed.
L 508	P. A. & S. Small Company, York, Pa.,	J. H. Walton, York Haven,	206	Boiled,	Passed.
L 550	V. H. Smith & Co., Philadelphia, Pa.,	Parkesburg Pharmacy, Parkesburg,	31	Raw,	Passed.
L 429	Smith, Kline & French Co., Phila., Pa.,	Boecking & Meridith, Bellwood,	127	Raw,	Passed.
L 252	Smith, Kline & French Co., Phila., Pa.,	Herbert T. Gregory, Wyoming,	212	Raw,	Passed.
L 481	Smith, Kline & French Co., Phila., Pa.,	J. H. Miller & Son, Newville,	179	Raw,	Passed.
L 544	Smith, Kline & French Co., Phila., Pa.,	Howard B. Sides, Downingtown,	25	Raw,	Passed.
L 412	Smith, Kline & French Co., Phila., Pa.,	Quinn & Smith, Johnsonburg,	110	Raw,	Passed.
L 421	Smith, Kline & French Co., Phila., Pa.,	Geo. F. Troutman & Co., Philipsburg,	119	Raw,	Passed.
L 761	Southern States Turpentine Co., Cleveland, O.,	B. G. Carpenter & Co., Wilkes-Barre,	98	Japanese boiled,	Passed. Mineral oil present.*
L 780	Southern States Turpentine Co., Cleveland, O.,	B. G. Carpenter & Co., Wilkes-Barre,	117	Japanese boiled,	Passed. Mineral oil present.*

L 500	Standard Linseed Co., Buffalo, N. Y.,	Brinstock Bros., Wrightsville,	198	Boiled,	Passed. Constants low.
L 683	Standard Linseed Co., Cleveland, Ohio,	Burry Markel Co., Evans City,	20	Raw,	Adulterated.
L 408	Standard Linseed Co., Buffalo, N. Y.,	Geo. F. Guy, Bradford,	106	Boiled,	Adulterated.
L 622	Standard Linseed Co., Buffalo, N. Y.,	Hatch Hardware Co., Union City,	103	Raw,	Adulterated.
L 673	Standard Linseed Co., Buffalo, N. Y.,	Horton Hardware Co., New Castle,	10	Boiled,	Passed. Constants low.*
L 613	Standard Linseed Co., Buffalo, N. Y.,	Home Hdwe. & Plumb. Co., Cambridge Springs,	94	Raw,	Adulterated.
L 639	Standard Linseed Co., Buffalo, N. Y.,	Kane Hardware and Stove Co., Kane,	120	Raw,	Adulterated.
L 350	Standard Linseed Co., Buffalo, N. Y.,	W. R. Logan Est., Blossburg,	48	Boiled,	Adulterated.
L 734	Standard Linseed Co., Buffalo, N. Y.,	W. R. Logan Est., Blossburg,	71	Boiled,	Adulterated.
L 588	Standard Linseed Co., Buffalo, N. Y.,	Geo. J. New, Blairsville,	69	Raw,	Passed.
L 682	Standard Linseed Co., Cleveland, Ohio,	L. E. Shoupe, Evans City,	19	Raw,	Adulterated.
L 793	Standard Linseed Co., Cleveland, Ohio,	Mark Speizer, South Sharon,	8	Pure Raw,	Passed.
L 402	Standard Linseed Co., Buffalo, N. Y.,	Thompson & Co., Mt. Jewett,	100	Boiled,	Adulterated.
L 420	Standard Linseed Co., Buffalo, N. Y.,	J. H. Turnback Hardware Co., Philipsburg,	118	Raw,	Passed.
L 680	Standard Linseed Co., Cleveland, Ohio,	J. E. Wright Hardware Co., Ellwood City,	17	Raw,	Adulterated.
L 573	Sterling Paint and Glass Co., Pittsburg, Pa.,	R. A. McClean & Son, Uniontown,	54	Raw,	Passed.
L 479	O. F. Strayer, Harrisburg, Pa.,	E. C. Riehwine, Boiling Springs,	177	Raw,	Passed.
L 513	J. C. Tanger Co., Hanover, Pa.,	Brillinger & Swartz, Emigsville,	211	Boiled,	Passed.
L 779	Thompson & Co., Allegheny, Pa.,	H. S. Blatt Hardware Co., Ellwood City,	116	Raw,	Passed.
L 666	Thompson & Co., Allegheny, Pa.,	F. F. Brierly & Sons, Beaver Falls,	3	Raw,	Adulterated.†
L 778	Thompson & Co., Allegheny, Pa.,	F. F. Brierly & Sons, Beaver Falls,	115	Raw,	Passed.
L 566	Thompson & Co., Allegheny, Pa.,	J. B. Coldsmith, Mt. Pleasant,	47	Raw,	Passed.
L 664	Thompson & Co., Allegheny, Pa.,	W. J. Davidson, Beaver Falls,	1	Boiled,	Passed.
L 668	Thompson & Co., Allegheny, Pa.,	Donaldson Hardware Co., Beaver,	5	Raw,	Passed.
L 430	Thompson & Co., Allegheny, Pa.,	W. B. Dysart, Bellwood,	128	Raw,	Passed.
L 435	Thompson & Co., Allegheny, Pa.,	B. F. Fink, Huntingdon,	133	Raw,	Passed.
L 560	Thompson & Co., Allegheny, Pa.,	T. C. Fox, Irwin,	41	Raw,	Passed.
L 425	Thompson & Co., Allegheny, Pa.,	Fox & Fox, Altoona,	123	Raw,	Passed.
L 565	Thompson & Co., Allegheny, Pa.,	Frisbie Hardware Co., Connellsville.	46	Raw,	Passed.
L 612	Thompson & Co., Allegheny, Pa.,	Graham & McClintock, Meadville,	93	Raw,	Passed.
L 558	Thompson & Co., Allegheny, Pa.,	Greensburg Hardware & Supply Co., Greensburg,	39	Raw,	Passed.
L 593	Thompson & Co., Allegheny, Pa.,	S. W. Hamilton, Vandergrift,	74	Raw,	Passed.
L 432	Thompson & Co., Allegheny, Pa.,	W. E. Heinly, Tyrone,	130	Raw,	Passed.
L 591	Thompson & Co., Allegheny, Pa.,	Hill Hardware Co., Leechburg,	72	Raw,	Passed.
L 678	Thompson & Co., Allegheny, Pa.,	H. R. Huston, New Castle,	15	Raw,	Passed.
L 590	Thompson & Co., Allegheny, Pa.,	J. C. McGeary & Son, Leechburg,	71	Raw,	Passed.
L 436	Thompson & Co., Allegheny, Pa.,	C. H. Miller Hardware Co., Huntingdon,	134	Boiled,	Passed.
L 589	Thompson & Co., Allegheny, Pa.,	J. C. Moore Supply Co., Saltsburg,	70	Raw,	Passed.
L 672	Thompson & Co., Allegheny, Pa.,	New Castle Hardware Store, New Castle,	9	Raw,	Passed.
L 553	Thompson & Co., Allegheny, Pa.,	T. J. O'Brien Hardware Co., Ligonier,	34	Raw.	Passed.
L 574	Thompson & Co., Allegheny, Pa.,	Rathmell Bros., Brownsville,	55	Raw,	Passed.
L 784	Thompson & Co., Allegheny, Pa.,	Reynoldsville Hardware Co., Reynoldsville.	3	Raw,	Passd.
L 609	Thompson & Co., Allegheny, Pa.,	J. M. Rhodes & Co., Meadville,	90	Boiled,	Passed.
L 592	Thompson & Co., Allegheny, Pa.,	Small & Hill, Leechburg,	73	Raw,	Passed.

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*Not sold as pure linseed oil.

†Evidence produced showing oil became adulterated after being shipped by manufacturer

RESULTS OF INSPECTION—Continued.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 586	Thompson & Co., Allegheny, Pa.,	J. M. Stewart & Co., Indiana,	67	Boiled,	Passed.
L 559	Thompson & Co., Allegheny, Pa.,	Temple & Sons, Greensburg,	40	Raw,	Passed.
L 595	Thompson & Co., Allegheny, Pa.,	C. H. Truby, Apollo,	76	Raw,	Passed.
L 554	Tohmpson & Co., Allegheny, Pa.,	L. B. Weller, Ligonier,	35	Raw,	Passed.
L 597	Thompson & Co., Allegheny, Pa.,	Frank T. Wray, Apollo,	78	Raw,	Passed.
L 665	Thompson & Co., Allegheny, Pa.,	R. E. Zimmerman, Beaver Falls,	2	Raw,	Passed.
L 271	Tiona Oil Company, New York, N. Y.,	Golden & McGuire, Dunmore,	231	Boiled,	Passed.
L 743	Treman King Co., Ithaca, N. Y.,	Horn & Derling, Galeton,	80	Raw,	Passed.
L 288	William Waterall & Co., Phila., Pa., and Camden, N. J.	Krulancheek Bros., Duryea,	248	Raw,	Passed.
L 289	William Waterall & Co., Phila., Pa., and Camden, N. J.	Krulancheek Bros., Duryea,	249	Boiled,	Passed.
L 801	Watson Paint and Glass Co., McKeesport, Pa.,	Matthew McIndoe, Pitcairn,	13	Raw,	Passed.
L 505	A. L. Webb & Sons, Baltimore, Md.,	J. E. C. Miller, New Oxford,	203	Boiled,	Passed.
L 246	Welliver Hdwe. Co., Danville, Pa.,	J. L. Turner & Co., Nanticoke,	206	Boiled,	Passed.
L 545	Geo. D. Wetherill & Co., Philadelphia, Pa.,	Horace A. Fetters E. Downingtown,	26	Raw,	Passed.
L 582	Geo. D. Wetherill & Co., Philadelphia, Pa.,	B. F. Fink, Huntingdon,	63	Raw,	Passed.
L 467	Geo. D. Wetherill & Co., Philadelphia, Pa.,	C. T. Rice, Newport,	165	Raw,	Passed.
L 656	Geo. D. Wetherill & Co., Philadelphia, Pa.,	Shannon & High, Watsontown,	137	Raw,	Passed.
L 808	The A. Wilhelm Co., Reading, Pa.,	J. Hanford Duke, Hatfield,	20	Pure Boiled,	Passed.
L 454	The A. Wilhelm Co., Reading, Pa.,	Martz Bros., Harrisburg,	152	Raw,	Passed.
L 237	Wilkes-Barre Specialty Co., Wilkes-Barre, Pa.,	S. C. Hartman, Plymouth,	197	Boiled,	Passed.
L 239	Wilkes-Barre Specialty Co., Wilkes-Barre, Pa.,	John R. Hatten, Edwardsville,	199	Raw,	Passed.
L 248	Wilkes-Barre Specialty Co., Wilkes-Barre, Pa.,	H. Merritt & Son, Plains,	208	Boiled,	Passed.
L 310	H. E. & D. G. Yarnall, Philadelphia, Pa.,	A. Smith & Son, Shamokin,	8	Raw,	Passed.
L 301	Zabriskie & L. Hommedine, E. Stroudsburg, Pa.,	H. F. Miller, Stroudsburg,	261	Raw,	Passed.
L 117	Unknown,	Acker & Fry, Phoenixville,	77	Raw,	Passed.
L 746	Unknown,	Albee & Seltz Co., Port Allegany,	83	Raw,	Passed.
L 193	Unknown,	John W. Alter, E. Pittsburg,	153	Raw,	Passed.
L 413	Unknown,	Arcade Hardware Co., Johnsonburg,	111	Raw,	Passed.
L 233	Unknown,	Frank Baab, Wilkes-Barre,	193	Boiled,	Passed.
L 11	Unknown,	James Barrett, Doylestown,	24	Boiled,	Passed. Constants low.

L 23	Unknown,	W. H. Beaver, Middleburg,	36	Raw,	Passed.
L 47	Unknown,	Beddall & Starr, Schuylkill Haven,	7	Boiled,	Passed.
L 59	Unknown,	Beddall & Wardrop, Mt. Carmel,	19	Boiled,	Passed.
L 116	Unknown,	The N. H. Bengaman Co., Phoenixville,	76	Boiled,	Passed.
L 4	Unknown,	Berger Glose Co., Allentown,	17	Boiled,	Passed.
L 60	Unknown,	S. E. Bergstresser & Co., Mt. Carmel,	20	Boiled,	Passed.
L 439	Unknown,	J. M. Beyer, Punxsutawney,	137	Boiled,	Passed.
L 86	Unknown,	Birnstock Bros., Wrightsville,	46	Boiled,	Passed.
L 35	Unknown,	J. P. Bixler & Son, Carlisle,	48	Boiled,	Passed.
L 660	Unknown,	J. E. Bonner, Juniata,	141	Raw,	Passed.
L 10	Unknown,	Boyer & Bro., Slatington,	23	Raw,	Passed.
L 194	Unknown,	Braddock Hardware & Supply Co., Braddock,	154	Raw,	Passed.
L 50	Unknown,	A. E. Brenner, Port Carbon,	10	Raw,	Passed.
L 160	Unknown,	Brown Hutchison Co., Wilkinsburg,	120	Boiled,	Passed.
L 195	Unknown,	F. B. Bruce & Co., Beaver Falls,	155	Raw,	Passed.
L 708	Unknown,	C. H. Bubb, Muncy,	45	Raw,	Passed.
L 64	Unknown,	Peter E. Buck & Sons, Ashland,	24	Boiled,	Passed.
L 118	Unknown,	J. A. Buckwalter, Royersford,	78	Raw,	Passed.
L 124	Unknown,	Carter Bros., Mercer,	84	Raw,	Adulterated.
L 217	Unknown,	Chambers Hardware Co., Oil City,	177	Boiled,	Passed.
L 200	Unknown,	Clifton & Robertson, Beaver,	160	Raw,	Passed.
L 37	Unknown,	Cochran and Alcock, Carlisle,	50	Raw,	Passed.
L 132	Unknown,	S. B. Colvin & Co., Mt. Pleasant,	92	Raw,	Passed.
L 163	Unknown,	The Collins Wall Paper Co., Charleroi,	123	Raw,	Passed.
L 28	Unknown,	Compton's Hardware Store, Harrisburg,	41	Raw,	Passed.
L 54	Unknown,	J. H. Conley & Sons, Shamokin,	14	Raw,	Passed.
L 55	Unknown,	J. H. Conley & Sons, Shamokin,	15	Boiled,	Passed.
L 139	Unknown,	D. N. Craft, Uniontown,	99	Raw,	Passed.
L 125	Unknown,	Crill & McCoy, Mercer,	85	Boiled,	Passed.
L 411	Unknown,	Daly & Garlick, Smethport,	109	Boiled,	Passed.
L 196	Unknown,	W. J. Davidson, Beaver Falls,	156	Boiled,	Passed.
L 72	Unknown,	Davies Hardware Co., Lansford,	32	Raw,	Passed.
L 9	Unknown,	Dettmer & Handwork, Slatington,	22	Boiled,	Passed.
L 167	Unknown,	H. C. Devore, Monongahela City,	127	Raw,	Passed.
L 204	Unknown,	Dickson & Co., Newcastle,	164	Boiled,	Passed.
L 189	Unknown,	Digby & Smith, McKees Rocks,	149	Raw,	Passed.
L 112	Unknown,	Diller Hardware Co., New Holland,	72	Boiled,	Adulterated.
L 173	Unknown,	E. G. Dudley, Washington,	133	Raw,	Passed.
L 67	Unknown,	Dunlap Hardware Co., Shenandoah,	27	Boiled,	Passed.
L 133	Unknown,	Eicher & Groft, Scottdale,	93	Raw,	Passed.
L 65	Unknown,	Ellis & McDermott Hdwe. Co., Shenandoah,	25	Raw,	Passed.
L 120	Unknown,	E. C. Erthal, Bristol,	80	Raw,	Passed.
L 198	Unknown,	S. J. Fair, Monaca,	158	Raw,	Passed.
L 251	Unknown,	Farrer & Peck, West Pittston,	211	Raw,	Passed.
L 18	Unknown,	B. F. Fink, Huntingdon,	31	Raw,	Passed.
L 129	Unknown,	Geo. W. Fink, Irwin,	89	Raw,	Passed.
L 214	Unknown,	Franklin Hardware Co., Franklin,	174	Raw,	Passed.
L 89	Unknown,	Michael Frey and George Bucher, Hanover,	49	Raw,	Passed.
L 138	Unknown,	Frey & Gilmore, Uniontown,	98	Raw,	Passed.

RESULTS OF INSPECTION—Continued.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 8	Unknown,	Wm. A. Fritzinger, Slatington,	21	Boiled,	Passed.
L 136	Unknown,	Frisbie Hardware Co., Connellsville,	96	Boiled,	Passed.
L 207	Unknown,	Fruit-Ohl Co., Sharon,	167	Boiled,	Passed.
L 105	Unknown,	H. P. Fry, Lititz,	65	Raw,	Passed.
L 171	Unknown,	Gessford Wall Paper Co., Washington,	131	Boiled,	Passed.
L 29	Unknown,	Henry Gilbert & Son, Harrisburg,	42	Boiled,	Passed.
L 212	Unknown,	D. A. Gill, Meadville,	172	Boiled,	Passed.
L 183	Unknown,	Goldsmith & Murphy, West Newton,	143	Raw,	Passed.
L 61	Unknown,	H. R. Goldsworthy & Co., Centralia,	21	Raw,	Passed.
L 188	Unknown,	Geo. F. Graff, Castle Shannon,	148	Raw,	Passed.
L 164	Unknown,	T. P. Grant, Charleroi,	124	Raw,	Passed.
L 279	Unknown,	J. M. & F. M. Graves, Jermyn,	239	Raw,	Passed.
L 166	Unknown,	A. M. Gregg, Monongahela City,	126	Raw,	Passed.
L 66	Unknown,	John Gregory, Shenandoah,	26	Boiled,	Passed.
L 14	Unknown,	Theo. Griffith & John Wollerton, Downingtown,	27	Raw,	Passed.
L 155	Unknown,	Groff Bros., Pittsburg,	115	Raw,	Passed.
L 77	Unknown,	Guss & Sieber, Mifflintown,	37	Raw,	Passed.
L 48	Unknown,	H. L. Gwiner, St. Clair,	8	Raw,	Passed.
L 24	Unknown,	Geo. W. Hackett, Sunbury,	37	Boiled,	Passed.
L 646	Unknown,	Geo. W. Hackett, Sunbury,	127	Raw,	Passed.
L 56	Unknown,	Hack-Sanner Hardware Co., Shamokin,	16	Raw,	Passed.
L 57	Unknown,	Hack-Sanner Hardware Co., Shamokin,	17	Boiled,	Passed.
L 71	Unknown,	J. M. Hadesty & Son, Tamaqua,	31	Boiled,	Passed.
L 27	Unknown,	Harrisburg Hardware Co., Harrisburg,	40	Boiled,	Passed.
L 179	Unknown,	Hartman Hardware Co., McKeesport,	139	Raw,	Passed.
L 38	Unknown,	Hauck Bros., Mechanicsburg,	51	Raw,	Passed.
L 260	Unknown,	Hazleton Machine and Supply Co., Hazleton,	220	Boiled,	Passed.
L 185	Unknown,	Heilman & Pirl, Duquesne,	145	Raw,	Passed.
L 25	Unknown,	W. H. Heim, Sunbury,	38	Boiled,	Passed.
L 68	Unknown,	H. J. Heiser & Co., Mahanoy City,	28	Raw,	Passed.
L 273	Unknown,	Henwoods Pharmacy, Providence,	233	Boiled,	Adulterated.
L 94	Unknown,	Herr & Company, Lancaster,	54	Raw,	Passed.
L 95	Unknown,	Herr & Company, Lancaster,	55	Boiled.	Passed.

L 2	Unknown,	F. Hersh Hardware Co., Allentown,	15	Boiled,	Passed.
L 69	Unknown,	John Hersker Est., Mahanoy City,	29	Boiled,	Passed.
L 168	Unknown,	B. H. Hodge, Donora,	128	Raw,	Passed.
L 174	Unknown,	R. S. Holbert, Washington,	134	Raw,	Passed.
L 184	Unknown,	Mrs. J. W. Holt, Ohio Pyle,	144	Boiled,	Passed.
L 134	Unknown,	Hoop Hardware Co., Connellsville,	94	Raw,	Passed.
L 201	Unknown,	Horton Hardware Co., Newcastle,	161	Boiled,	Passed.
L 255	Unknown,	Henry C. Johnson & Co., Luzerne,	215	Boiled,	Passed.
L 209	Unknown,	J. A. Kamerer, Greenville,	169	Boiled,	Passed.
L 208	Unknown,	Kitch & Mower, Sharpsville,	168	Boiled,	Passed.
L 75	Unknown,	Geo. Krause Hardware Co., Lebanon,	35	Raw,	Passed.
L 76	Unknown,	Geo. Krause Hardware Co., Lebanon,	36	Boiled,	Passed.
L 96	Unknown,	Lanc. Fire Proofing and Paint Co., Lancaster,	56	Raw,	Passed.
L 97	Unknown,	Lanc. Fire Proofing and Paint Co., Lancaster,	57	Boiled,	Passed.
L 157	Unknown,	Lawrence Paint Stores, Pittsburg,	117	Boiled,	Passed.
L 172	Unknown,	Lewis Pharmacy, Washington,	132	Raw,	Adulterated.
L 107	Unknown,	W. Litzenberger, Manheim,	67	Raw,	Passed.
L 210	Unknown,	Livingston & Moyer, Greenville,	170	Boiled,	Passed.
L 130	Unknown,	Geo. W. Lohr, Irwin,	90	Raw,	Passed.
L 45	Unknown,	J. H. Long, Orwigsburg,	5	Raw,	Passed.
L 111	Unknown,	J. H. Long, Strassburg,	71	Raw,	Passed.
L 17	Unknown,	H. M. Long & W. M. Bunting, Oxford,	30	Raw,	Passed.
L 73	Unknown,	Bert Luckenbuch, Mauch Chunk,	33	Raw,	Passed.
L 114	Unknown,	Elwood Ludwick, Honey Brook,	74	Raw,	Passed.
L 15	Unknown,	Nathan Lukens, Coatesville,	28	Raw,	Passed.
L 170	Unknown,	B. B. Lytle, Finleyville,	130	Raw,	Passed.
L 85	Unknown,	R. S. Magee, Wrightsville,	45	Boiled,	Passed.
L 33	Unknown,	W. F. Maginnis, Steelton,	46	Raw,	Passed.
L 623	Unknown,	C. B. Main, Union City,	104	Boiled,	Adulterated.
L 108	Unknown,	H. H. Martin, Manheim,	68	Boiled,	Passed.
L 197	Unknown,	Geo. W. Martsolf, New Brighton,	157	Raw,	Passed.
L 26	Unknown,	Martz Bros., Harrisburg,	39	Raw,	Passed.
L 149	Unknown,	The May Drug Co., Pittsburg,	109	Raw,	Passed.
L 20	Unknown,	H. Wilson Maxwell, Mt. Union,	33	Raw,	Passed.
L 62	Unknown,	McConnell & Bro., Ashland,	22	Boiled,	Passed.
L 218	Unknown,	James McCullough, Jr., Kittanning,	178	Raw,	Passed.
L 83	Unknown,	McFalls Paint Supply Co., York,	43	Boiled,	Passed.
L 84	Unknown,	McFalls Paint Supply Co., York,	44	Raw,	Passed.
L 206	Unknown,	J. W. McIntyre, Sharon,	166	Raw,	Passed.
L 219	Unknown,	J. S. McKean & Sons, New Kensington,	179	Raw,	Passed.
L 178	Unknown,	McKeesport Painters Supply Co., McKeesport,	138	Raw,	Passed.
L 152	Unknown,	C. F. McMurray, Pittsburg,	112	Boiled,	Passed.
L 710	Unknown,	Wm. Mendenhall, Montoursville,	47	Raw,	Passed.
L 13	Unknown,	J. L. Meredith, Jr., West Chester,	26	Boiled,	Passed.
L 143	Unknown,	C. A. Michel & Co., Pittsburg,	103	Raw,	Passed.
L 144	Unknown,	C. A. Michel & Co., Pittsburg,	104	Boiled,	Passed.
L 583	Unknown,	C. H. Miller Hardware Co., Huntingdon,	64	Raw,	Passed.
L 19	Unknown,	C. H. Miller Hardware Co., Huntingdon,	32	Boiled,	Passed.
L 127	Unknown,	L. G. Moore, Butler,	87	Raw,	Passed.

RESULTS OF INSPECTION—Continued.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 123	Unknown,	F. B. Moorehead, Volant,	83	Raw,	Passed.
L 119	Unknown,	Mowrey-Latshaw Hdwe. Co., Spring City,	79	Raw,	Passed.
L 180	Unknown,	National Hardware Co., McKeesport,	140	Raw,	Passed.
L 126	Unknown,	Naylor-Kohlmeyer Hardware Co., Grove City,	86	Raw,	Passed.
L 100	Unknown,	H. S. Newcomer, Mt. Joy,	60	Boiled,	Passed.
L 158	Unknown,	Grant C. Nobbs & Co., Pittsburg,	118	Raw,	Passed.
L 39	Unknown,	Nye & Conrad, Hummelstown,	52	Raw,	Passed.
L 32	Unknown,	C. Ober, Middletown,	45	Boiled,	Passed.
L 192	Unknown,	Frank A. Orr, Turtle Creek,	152	Raw,	Passed.
L 186	Unknown,	Orr Hardware Co., Homestead,	146	Raw,	Passed.
L 211	Unknown,	Packard Hardware Co., Greenville,	171	Boiled,	Passed.
L 12	Unknown,	Geo. J. Palmer, West Chester,	25	Boiled,	Passed.
L 199	Unknown,	Thomas Parks, Rochester,	159	Raw,	Passed.
L 220	Unknown,	W. J. Pauling & Co., Wilkes-Barre,	180	Boiled,	Passed.
L 153	Unknown,	Penn Hardware Co., Pittsburg,	113	Raw,	Passed.
L 154	Unknown,	Penn Hardware Co., Pittsburg,	114	Boiled,	Passed.
L 58	Unknown,	W. H. Phillips, Mt. Carmel,	18	Raw,	Passed.
L 145	Unknown,	Pittsburg Plate Glass Co., Pittsburg,	105	Raw,	Passed.
L 146	Unknown,	Pittsburg Plate Glass Co., Pittsburg,	106	Boiled,	Passed.
L 165	Unknown,	C. S. Pore Hardware Co., Monessen,	125	Raw,	Passed.
L 387	Unknown,	Potter Hoy Hardware Co., Bellefonte,	85	Raw,	Passed.
L 43	Unknown,	Pottsville Supply Co., Pottsville,	3	Raw,	Passed.
L 767	Unknown,	A. S. Powers, Pittston,	104	Raw,	Passed.
L 34	Unknown,	S. F. Prowell, New Cumberland,	47	Raw,	Passed.
L 187	Unknown,	P. Purger & Sons, Sharpsburg,	147	Raw,	Passed.
L 31	Unknown,	R. P. Raymond, Middletown,	44	Boiled,	Passed.
L 90	Unknown,	Reilly Bros. & Raub, Lancaster,	50	Boiled,	Passed.
L 91	Unknown,	Reilly Bros. & Raub, Lancaster,	51	Raw,	Passed.
L 190	Unknown,	Geo. Rome & Co., Carnegie,	150	Raw,	Passed.
L 176	Unknown,	Jesse L. Ross & Co., Waynesburg,	136	Raw,	Passed.
L 213	Unknown,	Frank Roueche, Meadville,	173	Boiled,	Passed.
L 30	Unknown,	The Ryder Hardware Store, Harrisburg,	43	Raw,	Passed.
L 51	Unknown,	F. W. Sanner, Minersville,	11	Raw,	Passed.

L 52	Unknown,	F. W. Sanner, Minersville,	12	Boiled,	Passed.
L 46	Unknown,	Sausser Bros., Schuylkill Haven,	6	Boiled,	Passed
L 162	Unknown,	C. N. Savage Co., California,	122	Raw,	Passed.
L 135	Unknown,	Schell Hardware Co., Connellsville,	95	Raw,	Passed.
L 16	Unknown,	H. Schmaltz & Co., Kennett Square,	29	Raw,	Passed.
L 7	Unknown,	N. S. Schmehl, Kutztown,	20	Raw,	Passed.
L 6	Unknown,	C. W. Schneller, Catasauqua,	19	Raw,	Passed.
L 182	Unknown,	Fred Schouf & Son, West Newton,	142	Raw,	Passed.
L 215	Unknown,	Schultz & Pardoe, Franklin,	175	Raw,	Passed.
L 216	Unknown,	Seep Bros., Oil City,	176	Boiled,	Passed.
L 21	Unknown,	J. B. Selheimer, Lewistown,	34	Boiled,	Passed.
L 70	Unknown,	D. G. Seligman & Co., Tamaqua,	30	Boiled,	Passed.
L 74	Unknown,	J. C. Sendel Est., Lehighton,	34	Boiled,	Passed.
L 22	Unknown,	G. W. Sheary, Lewistown,	35	Raw,	Passed.
L 1	Unknown,	C. Y. Shelly & Bro., Allentown,	14	Boiled,	Passed.
L 87	Unknown,	Samuel Shirk & Sons, Hanover,	47	Boiled,	Passed.
L 113	Unwnown,	J. W. Showalter, New Holland,	73	Boiled,	Passed.
L 98	Unknown,	Shreiner & Stauffer, Lancaster,	58	Boiled,	Passed.
L 99	Unknown,	Shreiner & Stauffer, Lancaster,	59	Raw,	Passed.
L 131	Unknown,	Shumaker, Ringer & Foster, Jeannette,	91	Raw,	Passed.
L 79	Unknown,	P. A. & S. Small Co., York,	39	Raw,	Passed.
L 80	Unknown,	P. A. & S. Small Co., York,	40	Boiled,	Passed.
L 202	Unknown,	Smith, Hutton & Kirk Co., Newcastle,	162	Boiled,	Passed.
L 368	Unknown,	S. W. Snodgrass, Mifflinburg,	66	Raw,	Passed.
L 109	Unknown,	I. G. Sprecher's Sons, Ephrata,	69	Boiled,	Passed.
L 169	Unknown,	W. S. Sprugg, Donora,	129	Raw,	Passed.
L 92	Unknown,	Steinman Hardware Co., Lancaster,	52	Raw,	Passed.
L 93	Unknown,	Steinman Hardware Co., Lancaster,	53	Boiled,	Passed.
L 147	Unknown,	Sterling Paint and Glass Co., Pittsburg,	107	Raw,	Passed.
L 148	Unknown,	Sterling Paint and Glass Co., Pittsburg,	108	Boiled,	Passed.
L 159	Unknown,	W. S. Stout, Wilkinsburg,	119	Raw,	Adulterated.
L 177	Unknown,	Stoy & Hill, Waynesburg,	137	Raw,	Passed.
L 104	Unknown,	C. R. Strickler, Columbia,	64	Raw,	Passed.
L 101	Unknown,	Stump & Mueller, Marietta,	61	Boiled,	Passed.
L 232	Unknown,	H. H. Swainbank, Wilkes-Barre,	192	Raw,	Passed.
L 44	Unknown,	Swalm Hardware Co., Pottsville,	4	Boiled,	Passed.
L 88	Unknown,	J. C. Tanger Co., Hanover,	48	Boiled,	Passed.
L 128	Unknown,	H. F. Thomas, Greensburg,	88	Raw,	Passed.
L 42	Unknown,	L. C. Thompson, Pottsville,	2	Boiled,	Passed.
L 41	Unknown,	L. C. Thompson, Pottsville,	1	Raw,	Passed.
L 191	Unknown,	Thompson & Miles Co., Wilmerding,	151	Raw,	Passed.
L 82	Unknown,	W. C. Throne & Co., York,	42	Boiled,	Passed.
L 142	Unknown,	United Paint Supply Co., Pittsburg,	102	Raw,	Passed.
L 141	Unknown,	S. Voorhees & Son, Brownsville,	101	Raw,	Passed.
L 63	Unknown,	L. C. Voshage, Ashland,	23	Raw,	Adulterated.
L 36	Unknown,	Wagener Hardware Co., Carlisle,	49	Boiled,	Passed.
L 49	Unknown,	Geo. B. Wagner, St. Clair,	9	Raw,	Passed.
L 161	Unknown,	Chas. W. Walmer Hdwe. Co., Wilkinsburg,	121	Raw,	Passed.
L 175	Unknown,	J. S. Washabaugh, Canonsburg,	135	Raw,	Passed.

RESULTS OF INSPECTION—Concluded.

Chemist's number.	Name and Address of Manufacturer or Importer.	Name and Address of Dealer.	Agent's number.	Kind of Oil.	Remarks.
L 121	Unknown,	Maurice Watson, Bristol,	81	Raw,	Passed.
L 181	Unknown,	Watson Paint and Glass Co., McKeesport,	141	Boiled,	Passed.
L 110	Unknown,	S. L. Weaver, Ephrata,	70	Raw,	Passed.
L 156	Unknown,	P. Weherr, Pittsburg,	116	Boiled,	Passed.
L 203	Unknown,	The Welch Hardware Co., Newcastle,	163	Boiled,	Passed.
L 205	Unknown,	Welch & Lower, Mahoningtown,	165	Raw,	Passed.
L 150	Unknown,	Henry Wheeler & Son, Pittsburg,	110	Raw,	Passed.
L 151	Unknown,	Henry Wheeler & Son, Pittsburg,	111	Boiled,	Adulterated.
L 222	Unknown,	Wilkes-Barre Hardware Co., Wilkes-Barre,	182	Boiled,	Passed.
L 704	Unknown,	Williamsport Hdwe. & Stove Co., Williamsport,	41	Raw,	Passed. Constants low.
L 369	Unknown,	E. C. Willits, Muncy,	67	Raw,	Passed.
L 78	Unknown,	J. Y. Wills & Sons, Duncannon,	38	Raw,	Passed.
L 102	Unknown,	Hiram Wilson Hardware Store, Columbia,	62	Boiled,	Passed.
L 103	Unknown,	Hiram Wilson Hardware Store, Columbia,	63	Raw,	Passed.
L 53	Unknown,	A. H. Witman, Minersville,	15	Raw,	Passed.
L 140	Unknown,	Wolfe & Paul, Brownsville,	100	Raw,	Passed.
L 258	Unknown,	Jere Woodring & Co., Hazleton,	218	Boiled,	Passed.
L 137	Unknown,	C. L. Work, New Haven,	97	Raw,	Passed.
L 115	Unknown,	D. M. Wright, Honey Brook,	75	Raw,	Passed.
L 122	Unknown,	J. Evans Wright, Parkesburg,	82	Raw,	Passed.
L 81	Unknown,	York Paint and Color Co., York,	41	Boiled,	Passed.
L 5	Unknown,	J. G. Young, Siegfried,	18	Raw,	Passed.
L 3	Unknown,	M. S. Young & Co., Allentown,	16	Boiled,	Passed.

Commonwealth of Pennsylvania

DEPARTMENT OF AGRICULTURE

BULLETIN No. 226

LIST OF

County and Local Agricultural Societies

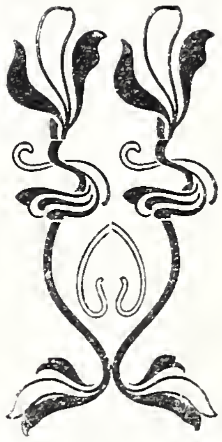
WITH NAMES AND ADDRESSES OF PRESIDENTS AND SECRETARIES
AND DATES FOR HOLDING FALL EXHIBITIONS OF 1912

COMPILED FROM OFFICIAL REPORTS AND SOURCES
BY

A. L. MARTIN
Deputy Secretary of Agriculture

JUNE 1, 1912—CORRECTED TO DATE

HARRISBURG:
C. E. AUGHINBAUGH, PRINTER TO THE STATE OF PENNSYLVANIA.
1912



PREFACE.

Harrisburg, Pa., May 31, 1912.

In order to promote correspondence and co-operation so far as may be possible among the agricultural societies and fair associations of the State, this Department again gives, in the following Bulletin, No. 226, as full a list as it has been able to secure of such societies and associations within the Commonwealth, together with the names and addresses of their officers, and the dates arranged for exhibitions during the coming Fall.

It will be noticed that some of the societies given in the list do not hold exhibitions. They, however, appear in the bulletin in order that the list of associations organized for the advancement of agricultural education may be as complete as possible, and to give other associations opportunity to correspond with them. The societies, whether holding fairs or not, are fruitful sources of good to the agriculture of the Commonwealth, and are assured of the sympathy and, as far as possible, the co-operation of this Department.

N. B. CRITCHFIELD,
Secretary of Agriculture.

LETTER OF TRANSMITTAL.

Harrisburg, Pa., June 1, 1912.

Hon. N. B. Critchfield, Secretary of Agriculture:

Dear Sir: This bulletin contains list of Local and County Agricultural and Horticultural Societies, dates of Fairs and Grange Exhibits to be held in Pennsylvania during the year 1912, as reported by Secretaries representing the different organizations.

The attendance for 1911 was 1,522,500, as compared with previous year, 1,543,473; total membership 11,328; amount received from State Fund, $32,387.63; amount paid in premiums, 1911, $108,377.50; amount offered in premiums, 1912, $128,200.00.

Very respectfully,

A. L. MARTIN,
Deputy Secretary.

List of County and Local Agricultural Societies, with Names and Addresses of Presidents and Secretaries and Dates for Holding Fall Exhibitions of 1912, Etc.

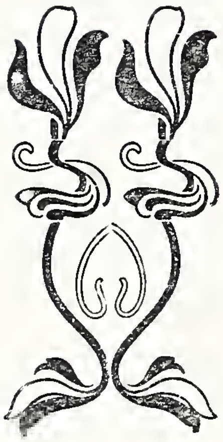
County.	Corporate Name of Society.	Name and Address of President.	Name and Address of Secretary.
	State Horticultural Association of Pennsylvania,	W. T. Creasy, Catawissa,	Chester J. Tyson, Floradale.
	Grangers Interstate Picnic Association,	R. H. Thomas, Mechanicsburg,	H. S. Mohler, Mechanicsburg.
	Encampment and Fair of Patrons of Husbandry,	Leonard Rhone, Centre Hall,	Leonard Rhone, Centre Hall.
Adams,	Fruit Growers Association of Adams County,	R. M. Eldon, Aspers,	E. C. Tyson, Floradale.
Allegheny,	Allegheny County Agricultural Association,	J. M. Patterson, Imperial,	H. W. DeLong, Imperial.
Armstrong,	Dayton Agricultural and Mechanical Association,	A. K. Good, Dayton,	C. C. Cochran, Dayton.
Bedford,	Bedford County Agricultural Society,	Dr. S. F. Statler, Bedford,	J. Roy Cessna, Bedford.
Bedford,	Osterburg Grange Picnic Association,	S. S. Kauffman, Osterburg,	Geo. W. Oster, Osterburg.
Berks,	Kutztown Fair Association,	Chas. D. Herman, Kutztown,	Dr. N. Z. Dunkleberger, Kutztown.
Berks,	Berks County Agricultural Association,	James McGowan, Geiger's Mills,	Daniel McDermot, Reading.
Blair,	Grange Fair Association of Blair County,	Dr. W. Frank Beck, Altoona,	H. S. Wertz, Duncansville.
Bradford,	Bradford County Agricultural Society,	Benj. Kuykendall, Towanda,	G. G. Johnston, Towanda.
Bradford,	Troy Agricultural Society,	J. W. Pomeroy, Troy,	W. S. Montgomery, Troy.
Bradford,	Wyalusing Fair Association,	S. M. Wells, Wyalusing,	G. M. Lyon, Wyalusing.
Bucks,	Bucks County Agricultural Society,	F. W. DeLancey, Sellersville,	I. Y. Baringer, Perkasie.
Bucks,	Farmers' Picnic and Exhibition,	Jacob M. Landis, Richland Center,	Harry S. Johnson, Quakertown.
Butler,	Butler Driving Park and Fair Association,	Geo. A. Schaffner, Butler,	W. B. Purvis, Butler.
Cambria,	Cambria County Agricultural Association,	C. E. Hicks, Carrolltown,	J. V. Maucher, M. D., Carrolltown.
Cameron,	Cameron County Agricultural Association,	F. X. Blumle, Emporium,	F. D. Judd, Emporium.
Carbon,	Carbon County Industrial Society,	O. Frank Acker, Lehighton,	J. Albert Durling, Lehighton.
Chester,	Oxford Agricultural Association,	Thos. F. Grier, Oxford,	H. C. Thomas, Oxford.
Chester,	Chester County Agricultural Association,	John H. Darlington, West Chester,	Fred De Rose Reid, West Chester.
Clarion,	Clarion County Fair Association,	B. W. Thompson, Clarion,	B. H. Thompson, Clarion.
Clearfield,	DuBois Driving Association,	B. B. McCreight, DuBois,	P. E. Griesemer, DuBois.
Columbia,	Columbia County Agricultural, Horticultural and Mechanical Association.	Wm. J. Hidley, Light Street, R. D.,	A. N. Yost, Bloomsburg.
Crawford,	Conneaut Lake Agricultural Association,	H. O. Holcomb, Exposition Park,	Chas. T. Byers, Exposition Park.
Cumberland,	Agricultural Society of Cumberland County,	Abram Bosler, Carlisle,	W. H. McCrea, Carlisle.
Cumberland,	Hogestown Horse and Cattle Show,	John C. Parker, Mechanicsburg,	Frank Martin, West Fairview.
Dauphin,	Middletown Fair Association,	C. S. Few, Middletown,	John W. Metzger, Middletown.
Dauphin,	Gratz Agricultural and Horticultural Association,	Harry Smith, Gratz,	F. S. Klinger, Gratz.
Erie,	Wattsburg Agricultural Society,	U. S. Fuller Wattsburg,	J. J. Rouse, Wattsburg.
Erie,	Corry Fair and Driving Park Association,	D. Warren De Rosay, Corry,	Wake Morgaridge, Corry.
Greene,	Greene County Agricultural and Manufacturing Society,	C. E. Lantz, Carmichaels,	W. A. Ruth, Carmichaels.
Indiana,	Indiana County Agricultural Society,	M. F. Jamison, Indiana,	David Blair, Indiana.
Jefferson,	Jefferson County Agricultural Society and Driving Park Association.	R. E. Reitz, Brookville,	A. B. Stewart, Brookville.

Juniata,	Juniata County Agricultural Society,	R. E. Groninger, Port Royal,	J. N. Groninger, Port Royal.
Lackawanna,	Lackawanna Fair and Grange Poultry Association,	J. F. Lacoe, Clarks Summit,	F. L. Thompson, Schultzville.
Lancaster,	Lancaster County Agricultural Society,	P. T. Watt, Lancaster,	J. F. Seldomridge, Lancaster.
Lawrence,	Pulaski Fair Association,	Geo. Watson, West Middlesex,	H. H. Knox, Pulaski.
Lebanon,	Lebanon Valley Fair Association,	W. H. Bollman, Lebanon,	J. A. Bollman, Lebanon.
Lebanon,	Lebanon County Agricultural and Horticultural Association,	E. A. Weimer, Lebanon,	S. P. Heilman, M. D., Heilmandale.
Lehigh,	Lehigh County Agricultural Society,	John W. Eckert, Allentown,	Harry B. Schall, Allentown.
Lycoming,	Muncy Valley Farmers' Club,	Wm. A. Ball, Hughesville,	Edw. E. Frontz, Hughesville.
McKean,	McKean County Fair Association,	R. W. Hilton, Smethport,	Henry Rice, Smethport.
Mercer,	Mercer County Agricultural Society,	J. M. Bentley, Mercer, R. D.,	Geo. H. Fowler, Stoneboro.
Mercer,	Mercer Central Agricultural Association,	A. J. McKean, Mercer,	J. P. Orr, Mercer.
Monroe,	Monroe County Agricultural Association,	W. C. Hood, Stroudsburg,	W. M. Burnett, Stroudsburg.
Northampton,	Northampton County Agricultural Association,	Dr. O. D. Schaeffer, Nazareth,	J. R. Reinheimer, Nazareth.
Northumberland,	Milton Fair and Northumberland County Agricultural Association.	James C. Packer, Sunbury,	Joseph H. Johnson, Milton.
Perry,	Perry County Agricultural Society,	T. H. Butturf, Newport.	J. C. F. Stephens, Newport.
Philadelphia,	Pennsylvania Horticultural Society,	C. B. Newbold, No. 511 Chestnut St., Philadelphia.	David Rust, Horticultural Hall, Philadelphia.
Sullivan,	Sullivan County Agricultural Society,	Albert Kaye, Forksville,	O. N. Molyneux, Dushore.
Susquehanna,	Susquehanna County Agricultural Society,	F. A. Davies, Montrose,	W. G. Comstock, Montrose.
Susquehanna,	Harford Agricultural Society,	[illegible]. A. Osborne, New Milford, R. D.,	O. F. Maynard, Harford.
Tioga,	Cowanesque Valley Agricultural Society,	George Rumsey, Westfield,	J. W. Smith, Westfield.
Tioga,	Smythe Park Association,	J. F. Pitts, Wellsboro,	R. C. Longbotham, Mansfield.
Tioga,	Tioga County Pomona Grange,	E. B. Dorsett, Mansfield,	W. H. Whiting, Wellsboro.
Union,	Union County Agricultural Society,	F. W. Getz, Lewisburg,	C. Dale Wolfe, Lewisburg.
Washington,	Union Agricultural Association,	H. S. Buchanan, Hickory, R. D. No. 3.	D. S. Taylor, Burgettstown, R. D. No. 3.
Washington,	Sandy Plains Fair Association,	Andrew Allen, Millsboro,	B. Frank Emery, Millsboro.
Warren,	Warren County Farmers' and Breeders' Association,	C. R. Hedges, Akeley,	R. J. Weld, Sugargrove.
Wayne,	Wayne County Agricultural Society,	W. L. Ferguson, Seelyville,	E. W. Gammell, Honesdale.
Westmoreland,	Westmoreland Agricultural Society,	M. P. Shoemaker, Greensburg,	W. F. Holtzer, Greensburg.
Wyoming,	Wyoming County Fair Association,	J. W. Stark, Tunkhannock,	F. S. Harding, Rosengrant.
York,	York County Agricultural Society,	John H. Wogan, York,	Henry C. Heckert, York.
York,	Hanover Agricultural Society,	C. J. Delone, Hanover,	J. B. Miller, Hanover.
York,	New Freedom Improvement Association,	G. L. Hartenstein, New Freedom,	M. F. Zeigler, New Freedom.
York,	Norrisville Farmers' Club,	M. E. Smith, New Park,	H. M. Anderson, New Park.

List of County and Local Agricultural Societies, with Names and Addresses of Presidents and Secretaries and Dates for Holding Fall Exhibitions of 1912, Etc.—Continued.

County.	Corporate Name of Society.	Attendance, 1911.	Race track.	Membership.	Amount received from State fund.	Premiums.		Held 1912.	
						Paid, 1911.	Offered, 1912.	Place.	Date.
	State Horticultural Association of Pennsylvania.			750		$500 00			No Fair.
	Grangers Interstate Picnic Association,	60,000		10				Williams Grove,	Aug. 26-31.
	Encampment and Fair of Patrons of Husbandry.	15,000		1,500	$150 00	200 00	$200 00	Center Hall,	Sept. 14-20.
Adams,	Fruit Growers Asso., of Adams County,			220				Benderville,	Dec. 18-20.
Allegheny,	Allegheny County Agricultural Asso.,	10,000	½ mile,	75		700 00	700 00	Imperial,	Sept. 10-13.
Armstrong,	Dayton Agrl. and Mechanical Asso.,	18,000	½ mile,	280	442 90	1,026 45	2,500 00	Dayton,	Sept. 24-27.
Bedford,	Bedford County Agricultural Society,	5,000	½ mile,	245	1,000 00	1,064 00	1,500 00	Bedford,	Oct. 1-4.
Bedford,	Osterburg Grange Picnic Association,	25,000		60				Osterburg,	Aug. 19-24.
Berks,	Kutztown Fair Association,	30,000	½ mile,	556	564 51	1,784 70	2,000 00	Kutztown,	Aug. 20-23.
Berks,	Berks County Agrl. and Hort. Asso.,	60,000	½ mile,	180	485 49	706 89	1,200 00	Reading,	Sept. 10-13.
Blair,	Grange Fair Asso. of Blair County,	40,000	½ mile,	15	1,000 00	1,123.75	1,500 00	Hollidaysburg,	Sept. 25-28.
Bradford,	Bradford County Agricultural Society,	15,000	½ mile,	200	450 00	1,600 00	1,600 00	Towanda,	Sept. 10-13.
Bradford,	Troy Agricultural Society,	12,000	½ mile,	3	214 00	822 45	2,500 00	Troy,	Sept. 3-6.
Bradford,	Wyalusing Fair Association,	5,000		120	100 00	300 00	1,000 00	Wyalusing,	Sept. 24-27.
Bucks,	Bucks County Agricultural Society,	8,000		16	554 00	554 00	1,000 00	Perkasie,	Sept. 18-21.
Bucks,	Farmers' Picnic and Exhibition,	10,000	½ mile,	90		200 00	200 00	Quakertown,	Sept. 6-7.
Cambria,	Cambria County Agricultural Asso.,	7,000	½ mile,	379		903 50		Carrolltown,	Sept. 3-6.
Cameron,	Cameron County Agricultural Asso.,	5,000		12	100 00	476 00	1,000 00	Emporium,	Sept. 10-13.
Carbon,	Carbon County Industrial Society, pany.	18,000	½ mile,	40	790 06	825 31	1,000 00	Lehighton,	Oct. 1-4.
Chester,	Oxford Agricultural Association,	15,000	½ mile,	16	500 00	4,800 00	4,800 00	Oxford,	Sept. 18-20.
Chester,	Chester County Agrl. Association,	20,000	½ mile,	130	500 00	1,900 00	2,000 00	West Chester,	Sept. 3-6.
Clarion,	Clarion County Fair Association,	15,000	½ mile,	200	100 00	2,800 00	3,000 00	Clarion,	Sept. 24-27.
Clearfield,	DuBois Driving Association,	15,000	½ mile,	85	800 00	900 00		DuBois,	Sept. 10-13.
Columbia,	Columbia County Agrl. Hort. and Mch. Association.	30,000	½ mile,	392	1,000 00	7,133 40	8,000 00	Bloomsburg,	Oct. 8-11.

Crawford,	Conneaut Lake Agricultural Association,	48,000	½ mile,		1,100 00	5,500 00	5,500 00	Exposition Park,	Aug. 26-30.
Cumberland,	Agricultural Society of Cumberland Co.,	25,000	½ mile,	60	1,000 00	1,858 30	2,000 00	Carlisle,	Sept. 24-27.
Cumberland,	Hogestown Horse and Cattle Show,	3,000						Hogestown,	June 5-6.
Dauphin,	Middletown Fair Association,	40,000	½ mile,	310	50 00	607 22	1,000 00	Middletown,	Sept. 10-13.
Dauphin,	Gratz Agrl. and Hort. Association,	7,000	½ mile,	65	510 00	549 00	1,000 00	Gratz,	Oct. 15-18.
Erie,	Wattsburg Agricultural Society,		½ mile,		362 00	500 00		Wattsburg,	Sept. 3-6.
Erie,	Corry Fair and Driving Park Association,	20,000	½ mile,	83	637 90	1,911 55	2,000 00	Corry,	Sept. 3-6.
Greene,	Greene Co., Agrl. and Manufacturing Soc.,	10,000	½ mile,	15	547 00			Carmichaels,	Sept. 17-20.
Indiana,	Indiana County Agricultural Society,	43,000	½ mile,		1,000 00	5,000 00		Indiana,	Sept. 3-6.
Jefferson,	Jefferson County Agrl. Society and Driving Park Association.	20,000	½ mile,		701 70	701 70	1,000 00	Brookville,	Sept. 17-20.
Juniata,	Juniata County Agricultural Society,	18,000	½ mile,	226	986.00	986.00	1,000 00	Port Royal,	Sept. 10-13.
Lackawanna,	Lackawanna Fair and Grange Poultry Association.	5,000	¼ mile,	70		513 00		Clarks Summit,	Sept. 24-28.
Lancaster,	Lancaster County Agrl. Fair Asso.,	65,000	½ mile,	362	1,000 00	2,747 45	3,500 00	Lancaster,	Oct. 1-4.
Lawrence,	Pulaski Fair Association,	10,000	½ mile,	100	1,000 00	1,500 00	1,500 00	Pulaski,	Sept. 10-12.
Lebanon,	Lebanon Valley Fair Association,	30,000	½ mile,	800	990 85	3,500 00	3,000 00	Lebanon,	Aug. 27-30.
Lebanon,	Lebanon County Agr. and Hort. Asso.,			150					No Fair.
Lehigh,	Lehigh County Agricultural Society,	200,000	½ mile,		1,000 00	25,000 00	25,000 00	Allentown,	Sept. 24-27.
Lycoming,	Muncy Valley Farmers' Club,	12,000	½ mile,	149	997 42	997 42	1,200 00	Hughesville,	Oct. 8-11.
McKean,	McKean County Fair Association,	20,000	½ mile,		100 00			Smethport,	Not decided.
Mercer,	Mercer County Agricultural Society,	25,000	½ mile,	280	500 00	2,300 00	3,000 00	Stoneboro,	Sept. 16-19.
Mercer,	Mercer Central Agricultural Association,	15,000	½ mile,		500 00	906 95		Mercer,	Sept. 3-5.
Monroe,	Monroe County Agricultural Society,	25,000	½ mile,	15	987,00	1,000 00		Stroudsburg,	Sept. 2-6.
Northampton,	Northampton County Agrl. Association,	50,000	½ mile,	325	1,000 00	1,488 95	4,000 00	Nazareth,	Sept. 10-13.
Northumberland,	Milton Fair and Northumberland Co., Agricultural Association.	25,000	½ mile,	132	844 70	1,122 40	2,500 00	Milton,	Oct. 1-4.
Perry,	Perry County Agricultural Society,	10,000	½ mile,	400	969 95	969 95	1,500 00	Newport,	Oct. 8-11.
Philadelphia,	Pennsylvania Horticultural Society,			870		2,200 00	2,400 00	Philadelphia,	Nov. 5-8.
Sullivan,	Sullivan County Agricultural Society,	2,500		60	434 75	434 75	800 00	Forksville,	Sept. 24-26.
Susquehanna,	Susquehanna County Agricultural Society,	6,000		35		893 51	1,000 00	Montrose,	Sept. 10-12.
Susquehanna,	Harford Agricultural Society,	4,000				500 00	800 00	Harford,	Sept. 25-26.
Tioga,	Cowanesque Valley Agricultural Society,	10,000	½ mile,	25	409 00	1,400 00	2,000 00	Westfield,	Sept. 10-13.
Tioga,	Smythe Park Association,	50,000	½ mile,		590 00	2,400 00	3,000 00	Mansfield,	Sept. 17-20.
Tioga,	Tioga County Pomona Grange,			400				Wellsboro,	September.
Union,	Union County Agricultural Society,	20,000	½ mile,	202	1,000 00	1,223 75	1,500 00	Lewisburg,	Sept. 24-27.
Washington,	Union Agricultural Association,	37,000	½ mile,		500 00	3,786 75	4,000 00	Burgettstown,	Oct. 1-3.
Washington,	Sandy Plains Fair Association,	4,500	½ mile,			1,700 00	2,000 00	Millsboro,	Aug. 13-16.
Warren,	Warren County Farmers' and Breeders' Association.				40 00				No Fair.
Wayne,	Wayne County Agricultural Society,	10,000	½ mile,	15	758 40	758 40	2,000 00	Honesdale,	Sept. 30-Oct. 3.
Westmoreland,	Westmoreland Agricultural Society,	15,000	½ mile,	100	1,000 00	2,126 60	3,500 00	Youngwood,	Sept. 10-13.
Wyoming,	Wyoming County Fair Association,	12,000	½ mile,	165	1,000 00	1,187 00	2,500 00	Tunkhannock,	Sept. 17-20.
York,	York County Agricultural Society,	145,000	½ mile,	220	1,100 00	5,604 00	6,000 00	York,	Oct. 7-11.
York,	Hanover Agricultural Society,	30,000	½ mile,			3,000 00	3,500 00	Hanover,	Sept. 17-20.
York,	New Freedom Improvement Association,	7,000		53		150 00	200 00	New Freedom,	Sept. 26-28.
York,	Norrisville Farmers' Club,	10,500		42			400 00	Fawn Grove,	Aug. 7-9.
	Total,	1,522,500		11,328	32,387 63	108,377 50	128,200 00		



Commonwealth of Pennsylvania

DEPARTMENT OF AGRICULTURE

BULLETIN No. 227

LIST OF

LICENSED VETERINARIANS IN PENNSYLVANIA

MAY 1912

HARRISBURG:
C. E. AUGHINBAUGH, PRINTER TO THE STATE OF PENNSYLVANIA
1912.

PREFACE.

Inquiries are frequently made at this Department, and particularly at the Veterinary Bureau of the Department, in relation to the organization of the State Board of Veterinary Medical Examiners and Registration, and concerning Veterinarians that are licensed to practice their profession in the State, and in order that these inquiries may be answered promptly, and information upon this subject given in advance as well, this bulletin is published, giving an alphabetical list of the legally qualified Veterinarians of the State, together with their counties and postoffice address.

A second list is given, in which the Veterinarians of the State are tabulated according to counties, which, for some purposes, will make the information much more convenient.

N. B. CRITCHFIELD.
Secretary of Agriculture.

MEMBERS OF THE STATE BOARD

OF

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Examinations for license to practice Veterinary Medicine are held at Philadelphia on the third Monday and Tuesday of June and December of each year.

All communications regarding information pertaining to laws, "To regulate the practice of veterinary medicine and surgery in Pennsylvania, and in reference to examinations," etc., etc., should be addressed to the Secretary, Dr. J. W. SALLADE, Auburn, Pa.

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA

NAME	ADDRESS	COUNTY	COLLEGE
Adams, John W.,	39th & Woodland Ave., Phila.	Phila.,	U. P.
Albright, John C.,	Greensburg,	Westmoreland.	
Allen, David V.,	Moscow,	Lackawanna.	
Allen, William,	Mill Hall, R. F. D. 2,	Clinton.	
Allis, Ned H.,	Wyalusing,	Bradford,	Ontario.
Athouse, Edward P.,	Sunbury,	Northumberland,	U. P.
Ames, Arthamer, Jr.,	Saltsburg, R. F. D. 4,	Westmoreland.	
Anderson, Aexander R.,	Johnstown,	Cambria,	U. S. College.
Andress, Wm. Russell,	4922 Clarissa St., Phila.,	Phila.,	U. P.
Ankeney, C. A.,	Harnedsville,	Somerset.	
Appel, William W.,	Passer,	Bucks,	N. Y. College.
Ardary, Robert W.,	Penn Ave. & 31st St., Pittsburgh.	Allegheny,	Ontario.
Arnold, William,	Wapwallopen, R. F. D. 1,	Luzerne.	
Ash, Wesley,	Meadville,	Crawford,	Castrator.
Ashmore, C. D.,	Newville,	Cumberland,	U. S. College.
Atorthy, N. C.,	Carnegie,	Allegheny,	Bengal & Ohio.
Bachman, Leidy J.,	South Bethlehem,	Northampton,	American.
Bagnall, Charles H.,	Franklin,	Venango,	Chicago.
Bagnall, William P.,	Oil City,	Venango,	Chicago.
Baker, Eli A.,	Espy,	Columbia,	Ontario.
Balliet, Harvey J.,	Bowmanstown,	Carbon,	Ontario.
Bane, M. A.,	Fredericktown,	Washington.	
Barclay, Francis J.,	Industry, R. F. D. 1,	Beaver,	Castrator.
Barker, Frank P.,	Coburn,	Centre.	
Barnard, Harry W.,	Lancaster,	Lancaster,	U. P.
Barnes, H. W.,	Thompson, R. F. D. 1,	Susquehanna,	U. P.
Barnes, Miller F.,	39th & Woodland Ave., Phila.	Phila.,	U. P.
Barr, George A.,	Marion Centre, R. F. D. 3,	Indiana.	
Barrett, Edson A.,	Susquehanna,	Susquehanna.	
Bartholomew, Jonathan C.,	Berwyn,	Chester,	U. P.
Bassler, Daniel F.,	Woodbury,	Bedford.	
Baum, Abraham L.,	Pennsburg,	Montgomery,	Ontario.
Baum, Howard L.,	Shelly,	Bucks,	Ontario.
Baumgardner, J. C.,	Cottage,	Huntingdon.	
Bausman, Abraham B.,	Millersville,	Lancaster.	
Bausticker, Edward S.,	York,	York.	
Baver, Alvin F.,	Stony Run,	Berks,	Chicago.
Beachy, Rufus M.,	Meyersdale,	Somerset.	
Bear, Harry H.,	Mount Joy,	Lancaster,	American.
Beattie, B. M.,	Chambersburg,	Franklin,	U. P.
Beck, Wm.,	Royersford,	Montgomery.	
Becker, Henry N.,	Elizabethtown, R. F. D. 3,	Lancaster.	
Becker, Jacob N.,	Palmyra,	Lebanon.	
Becker, Stehman S.,	Manheim,	Lancaster,	Chicago.
Beecher, William H.,	Brodbecks, R. F. D. 2,	York.	
Behrens, Edward E.,	2121 N. 7th St., Phila.,	Phila.,	U. P.
Bell, Boyd,	Turnip Hole,	Clarion.	
Bender, Harry E.,	Lititz,	Lancaster,	U. P.
Bender, Weidler K.,	Lititz,	Lancaster.	
Bennett, Norval C.,	Laceyville, R. F. D. 36,	Wyoming.	
Berg, Adolph,	Doylestown,	Bucks,	Berlin.
Berger, R. L.,	Shartlesville,	Berks,	Grand Rapids.
Bethune, J. G.,	Punxsutawney,	Jefferson,	Cincinnati.
Betz, Jacob W.,	Palmyra, R. F. D. 1,	Lebanon.	
Bickel, Daniel G.,	Green Lane, R. F. D. 1,	Montgomery.	
Bickley, John S.,	1703 Green St., Phila.,	Phila.	
Bieber, U. S. G.,	Kutztown,	Berks,	American.
Biehl, Walter G.,	Loyalsock,	Lycoming,	American.
Bigelow, F. C.,	Carlisle,	Cumberland,	U. P.
Biggs, William M.,	Gettysburg,	Adams.	
Biles, Charles R.,	Jersey Shore,	Lycoming,	U. P.
Bilger, Enos,	Middleburg,	Snyder.	
Bilger, W. David,	Middleburg, R. F. D. 3,	Snyder.	
Birch, W. A.,	1124 N. 4th St., Phila.,	Phila.,	N. Y. College.
Bitler, Sherman E.,	Turbutville,	Northumberland,	Ontario.

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continue

NAME	ADDRESS	COUNTY	COLLEGE
Bitner, Samuel A.,	Springs Mills, R. F. D. 3,	Centre.	
Bittles, Edmund E.,	New Castle,	Lawrence,	Ontario.
Black, Alvin F.,	Alum Rock, R. F. D. 1,	Clarion.	
Blank, Gillmor G.,	Allentown,	Lehigh,	Ontario.
Blank, Henry L.,	Lehighton,	Carbon.	
Bolich, Harry P.,	Mt. Carmel,	Northumberland,	U. P.
Bonner, James C.,	Garland,	Warren.	
Booker, S. F.,	Kittanning,	Armstrong.	
Boorem, John,	Mountain Home,	Monroe.	
Booth, E. T.,	221 S. 36th St., Phila.,	Phila.,	U. P.
Borneman, Harris S.,	Norristown,	Montgomery,	Ontario.
Bostock, Charles B.,	New Britain,	Bucks,	Royal.
Bowen, William J.,	Wellsboro, R. F. D. 9,	Tioga.	
Bower, Henry,	2306 W. Huntington St., Phila.	Phila.,	U. P.
Bowersox, John F. D.,	Aaronsburg,	Centre.	
Bowersox, D. F.,	Aaronsburg,	Centre.	
Boyd, Charles W.,	North Side, Pittsburgh,	Allegheny,	U. P.
Boylan, John L.,	763 N. 43rd St., Phila.,	Phila.,	U. P.
Brackbill, John C.,	Soudersburg,	Lancaster.	
Bradley, John L.,	Mercersburg,	Franklin,	American.
Brady, Howard B.,	Lancaster,	Lancaster,	Ontario.
Bredt, Martin,	1626 S. 4th St., Phila.,	Phila.,	U. P.
Brehm, Samuel E.,	Hummelstown,	Dauphin.	
Breidenthal, William H.,	Loysburg,	Bedford.	
Breneman, Henry F.,	Mount Joy, R. F. D. 4,	Lancaster.	
Bridge, Charles E.,	228 N. 53d St., Phila.,	Phila.,	American.
Bridge, Francis,	228 N. 53d St., Phila.,	Phila.	
Brindle, David C.,	Chambersburg,	Franklin,	Ontario.
Britton, E. Grant,	Butler,	Butler,	Ontario.
Brodhead, Charles W.,	Montrose,	Susquehanna.	
Brossman, Charles W.,	Womelsdorf,	Berks,	Ontario.
Brown, Phares,	Penbrook,	Dauphin.	
Brubaker, Edwin S.,	Ephrata, R. F. D. 2,	Lancaster.	
Bruner, Samuel E.,	Greensburg,	Westmoreland,	U. P.
Bryan, Milton M.,	Altoona,	Blair.	
Bryce, John,	Erie,	Erie,	Ontario.
Bryson, John B.,	Ephrata,	Lancaster.	
Buchanon, John W.,	Liverpool, R. F. D. 2,	Perry.	
Buckwalter, Dorous,	Lancaster, R. F. D. 6,	Lancaster.	
Burd, Harvey W.,	1515 Thompson St., Phila.,	Phila.,	U. P.
Burke, H. I.,	805 Vine St., Phila.,	Phila.,	Chicago.
Burkett, Simon T.,	Falls Creek,	Clearfield.	
Bush, Irving M.,	Altoona,	Blair,	Chicago.
Bushong, G. L.,	Dover,	York,	U. P.
Butler, Horace L.,	Ariel,	Wayne.	
Cade, George L.,	Galilee,	Wayne,	Chicago.
Cahill, Edw. A.,	Canonsburg,	Washington,	U. P.
Campbell, H. C.,	39th St. & Woodland Ave., Philadelphia.	Phila.,	U. P.
Carlisle, Thomas S.,	8413 Shawnee St., Chestnut Hill, Phila.	Phila.,	U. P.
Carter, Barclay F.,	21 W. Fornance St., Norristown.	Montgomery,	U. P.
Cassel, Eli,	Norristown,	Montgomery.	
Castor, Thomas,	4914 Frankford Ave., Phila.	Phila.,	U. P.
Cawley, Amos O.,	Lewisburg,	Union,	American.
Cawley, William W.,	Lewisburg,	Union.	
Chodes, B. P.,	Gap,	Lancaster,	U. P.
Chrisman, Merton J.,	Warren,	Warren,	Ontario.
Church, Harry R.,	Wilkes-Barre,	Luzerne,	Ontario.
Clark, William B.,	Strasburg,	Lancaster.	
Cleaver, Kilburn H.,	Reading,	Berks,	Ontario.
Cline, William,	Lancaster,	Lancaster.	
Cooke, H. T. B.,	1249 N. 28th St., Phila.,	Phila.	
Cooke, Wm. A., Jr.,	1249 N. 28th St., Phila.,	Phila.,	U. P.
Coble, Ira G.,	Bath,	Northampton.	
Cole, A. B.,	Montrose, R. F. D. 2,	Susquehanna,	Ontario.
Cole, G. P.,	Grove City,	Mercer,	Ontario.
Coleman, David H.,	8938 Frankford Ave., Torresdale, Phila.	Phila.,	Ontario.
Collins, Charles O.,	West Leesport,	Berks,	Ontario.
Collins, Milton J.,	Myerstown,	Lebanon.	
Collins, Horace H.,	Elizabethville,	Dauphin.	
Collner, Levi,	St. Petersburg,	Clarion.	
Collom, William B.,	Doylestown,	Bucks,	N. Y. College
Conard, Milton E.,	West Grove,	Chester,	U. P.
Coover, Eugene McL.,	Erie,	Erie,	Chicago.

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continued.

NAME	ADDRESS	COUNTY	COLLEGE
Corkill, Joseph J.,	Mauch Chunk,	Carbon,	Grand Rapids.
Cornman, Ernest L.,	Marietta,	Lancaster,	U. P.
Cory, Ara O.,	Coryville,	McKean.	
Cox, Harry B.,	1516 Snyder Ave.,	Phila.,	American.
Craumer, Wesley E.,	Hanover,	York.	
Crawford, Eli M.,	Athens,	Bradford,	Ontario.
Critchfield, Norman B.,	Stoyestown,	Somerset.	
Culp, Francis R.,	Arendtsville,	Adams.	
Cummings, James D.,	Monroeton,	Bradford.	
Curley, E. M.,	Pottsville,	Schuylkill,	U. P.
Curry, Basil G.,	E. Huntingdon,	Huntingdon,	Ontario.
Custis, Howard H.,	Malvern,	Chester,	U. P.
Daub, Samuel E.,	Spring City,	Chester.	
Davies, Montague A.,	Troy,	Bradford.	
Davidheiser, Allen K.,	Pottstown,	Montgomery,	N. Y. College.
Davis, Elisha J.,	Little Marsh,	Tioga.	
Davis, Evan R.,	Hatboro,	Montgomery.	
Davis, Fred E.,	Nanticoke,	Luzerne,	U. P.
Davis, R. Lewis,	Hatboro,	Montgomery.	
Davis, L. Blake,	827 E. Girard Ave., Phila.,	Phila.,	U. P.
Davison, Richard Y.,	Morton,	Delaware,	U. P.
Deardorff, J. A.,	Biglerville, R. F. D. 3,	Adams.	
Deardorff, Jacob W.,	Mont Alto, R. F. D. 1,	Franklin.	
Deck, William,	Bethel,	Berks.	
Deckard, Israel K.,	Middletown,	Dauphin,	American.
Deeds, Owen P.,	Shillington,	Berks.	
DeHaven, Frank R.,	Wayne,	Delaware.	
Dengler, Harry O.,	Norristown,	Montgomery,	Ontario.
Denton, W. James,	1812½ Market St., Phila.,	Phila.	
DeSwan, George W.,	120 Rector St., Manayunk, Phila.	Phila.	
Detar, Clem M.,	Fryburg,	Clarion,	Ontario.
DeTurck, Daniel H.,	Birdsboro,	Berks,	Chicago.
DeTurk, Martin D.,	Oley,	Berks,	Chicago.
Detwiler, David C.,	Iron Bridge,	Montgomery,	Ontario.
Detwiler, George D.,	Woodbury, R. F. D. 2,	Bedford.	
Deubler, E. C.,	Media, R. F. D. 3,	Delaware,	U. P.
Devlin, R. A.,	2034 Wallace St., Phila.,	Phila.,	U. P.
Dick, George A.,	Kane,	McKean,	U. P.
Diemer, Ardemus,	Spring City,	Chester.	
Dilling, Conrad B.,	Lakemont, Box No. 3, Star Route.	Blair.	
Dilling, Jacob L.,	Clover Creek,	Blair.	
Dingley, E. C.,	5335 Delancy St., Phila.,	Phila.,	U. P.
Dohan, Charles A.,	Darling,	Delaware,	U. P.
Doutt, James L.,	Union City, R. F. D. 4,	Erie.	
Downs, Morris M.,	Lionville,	Chester,	N. Y. College.
Drake, Mayhar W.,	1315 Wharton St., Phila.,	Phila.,	American.
Dreibelbis, Perry K.,	Virginville, R. F. D. 1,	Berks,	Ontario.
Dreisbach, Lewis,	Schuylkill Haven,	Schuylkill.	
Drummond, Gilbert G.,	2734 N. 11th St., Phila.,	Phila.,	U. P.
DuBois, George B.,	Wilkes-Barre,	Luzerne,	Ontario.
Dunkelberger, John W.,	Bernville,	Berks,	Ontario.
Easen, Thomas,	Wilkes-Barre,	Luzerne,	U. P.
Ebright, Norman,	Mifflintown,	Juniata,	Ontario.
Eckman, Thomas T.,	Sixth & Market Sts., Phila.	Phila.,	U. P.
Edwards, Warren T.,	5610 Pemberton St., Phila.,	Phila.,	U. P.
Elder, Norington H.,	Alum Rock, R. F. D. 1,	Clarion.	
Elkin, Albert F.,	Smicksburg, R. F. D. 1,	Indiana,	Grand Rapids & McKillip.
Elkin, Joseph H.,	Indiana,	Indiana,	Grand Rapids.
Elviage, James C.,	Erie,	Erie,	Ontario.
Emery, Harry,	Clarion,	Clarion,	Ohio.
Erb, Daniel B.,	East Petersburg,	Lancaster.	
Eshleman, John B.,	Parkesburg,	Chester,	U. P.
Evans, Mordecai L.,	Phoenixville,	Chester.	
Exley, John H.,	Knox, R. F. D. 3,	Clarion.	
Eyman, John O.,	616 Fifth Ave., McKeesport.	Allegheny.	
Faivre, A. L.,	Latrobe,	Westmoreland.	
Fallows, George T.,	Chester,	Delaware.	
Falls, Francis,	Phoenixville,	Chester,	U. P.
Farley, Harry M.,	Milnesville,	Luzerne,	U. P.

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continued.

NAME	ADDRESS	COUNTY	COLLEGE
Feather, Jacob,	Lebanon,	Lebanon.	
Feiser, Robert P.,	East Berlin,	Adams.	
Feist, Arnold A.,	Veterinary Hospital, U. of P.	Phila.,	U. P.
Felton, Howard B.,	5424 Second St., Pike, Olney, Phila.	Phila.,	U. P.
Fenstermacher, J. O.,	New Tripoli,	Lehigh.	
Ferley, John T. Jr.,	1728 S. 15th St., Phila.,	Phila.,	American.
Fernsler, Frank U.,	Lebanon,	Lebanon,	U. P.
Fessler, R. H.,	Pine Grove,	Schuylkill,	U. P.
Fetherolf, George R.,	Reading,	Berks,	Ontario.
Fiedler, Michael P.,	Millheim,	Center,	U. P.
Fitzpatrick, Dennis B.,	3214 Woodland Ave., Phila.	Phila.,	U. P.
Foelker, John C.,	Allentown,	Lehigh.	
Foelker, Samuel J.,	Allentown,	Lehigh,	Ontario.
Foos, Arthur C.,	Hazleton,	Luzerne,	Ontario.
Ford, Simon,	East Freedom,	Blair.	
Foster, Jesse D.,	Newtown,	Bucks,	U. S. College.
Fouse, Clyde E.,	Ambridge,	Beaver,	U. P.
Foust, David,	Strawberry Ridge, R. F. D. 1.	Montour.	
Fox, William W.,	Hummelstown,	Dauphin,	U. P.
Fox, Philip M.,	Sligo, R. F. D. 3,	Clarion.	
Frank, Philip C.,	Spring Mills, R. F. D. 4,	Centre.	
Frazee, David L.,	Washington, R. F. D. 4,	Washington.	
Frazier, John,	Butler,	Butler.	
Freed, Byron M.,	Sharon,	Mercer,	Ontario.
Fridirici, Ulysses G.,	Tamaqua,	Schuylkill,	Ontario.
Friedline, Jacob P.,	Somerset, R. F. D. 4,	Somerset,	Castrator.
Fritz, Simon P.,	Pine Hill,	Somerset,	Castrator.
Fry, Hugh L.,	Milton,	Northumberland,	U. P.
Fry, William H.,	Pine Grove Mills,	Centre.	
Fuller, George S.,	1715 N. 12th St., Phila.,	Phila.,	N. Y. College.
Fuller, Willis D.,	Somerset,	Somerset,	U. P.
Fulmer, Solomon,	Smithton,	Westmoreland.	
Gallup, Charles C.,	Smethport,	McKean.	
Gatchell, Enoch M.,	West Chester,	Chester.	
Gay, Jode S.,	Wyalusing,	Bradford.	
Gearhart, D. C.,	215 South St., East Liberty.	Allegheny,	American.
Gelbert, Charles S.,	Altoona, 1303 7th Ave.,	Blair,	U. P.
Gerety, J. P.,	3433 Lancaster Ave., Phila.	Phila.,	U. P.
Gilbert, Elwood G.,	Pottstown,	Montgomery,	American.
Gilliland, S. H.,	Marietta.	Lancaster,	U. P.
Gimper, William S.,	Harrisburg,	Dauphin,	U. P.
Gise, John B.,	Gratz,	Dauphin.	
Gladfelter, Michael H.,	Jacobus,	York.	
Gladfelter, Robert,	1230 N. 18th St., Phila.,	Phila.	
Glass, Alexander,	2321 Spruce St., Phila.,	Phila.,	Montreal.
Good, Charles R.,	Lock Haven,	Clinton,	Ontario.
Goldhaft, Arthur D.,	527 Pine St., Phila.,	Phila.,	U. P.
Gordner, Daniel R.,	Hughesville,	Lycoming.	
Gorman, David A.,	Kittanning,	Armstrong.	
Gorman, R. A.,	Berlin,	Somerset,	Chicago.
Graham, James,	115 Queen Lane, Germantown, Phila.	Phila.,	Royal.
Graham, John J.,	115 Queen St., Gtn., Phila.	Phila.,	U. P.
Gramley, Joseph A.,	Mifflinburg,	Union.	
Gratz, Oscar H.,	1844 Centre Ave., Pittsburgh.	Allegheny,	U. S. College.
Graybill, Guy M.,	East Petersburg,	Lancaster,	U. P.
Green, Elebbens,	Cambridge Springs,	Crawford.	
Green, Louis K.,	Boothwyn,	Delaware,	U. P.
Greenfield, George W.,	Corry,	Erie,	U. P.
Greenlee, C. W.,	716 11th St., Beaver Falls,	Beaver,	Ohio.
Gregg, Ira M.,	S. Brownville,	Fayette.	
Gregory, Charles W.,	York,	York.	
Gregory, John E.,	Stroudsburg,	Monroe,	U. P.
Griest, Franklin W.,	Osceola Mills,	Clearfield.	
Griffith, John J.,	Bradford,	McKean,	U. P.
Grigger, John,	Plymouth,	Luzerne.	
Groner, Lewis R.,	Bath,	Northampton,	Ontario.
Gross, William D.,	Reading,	Berks,	Ontario.
Gross, Reuben C.,	Elizabethtown,	Lancaster,	N. Y. College.
Grove, Philip H.,	Lewisburg, R. F. D. 1,	Union.	

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continued.

NAME	ADDRESS	COUNTY	COLLEGE
Gruber, Charles D.,	Bernville,	Berks,	Ontario.
Gruver, Elias A.,	Quakertown,	Bucks,	. Y. College.
Guilfoyle, Calvert T.,	1526 N. Gratz St., Phila.,	Phila.,	U. P.
Guilfoyle, Harold N.,	1526 N. Gratz St., Phila.,	Phila.,	. S. College.
Gunner, Benj.,	Sewickley,	Allegheny,	U. P.
Gwinner, C. W.,	39th & Woodland Ave., Phila.	Phila.,	U. P.
Haas, James A.,	Harrisburg,	Dauphin,	American.
Haas, Soloman,	Schnecksville, R .F. D. 1,	Lehigh.	
Hackler, H. D.,	2068 E. Fletcher St., Phila.	Phila.,	Ontario.
Haenn, Joseph E.,	Malvern,	Chester,	U. P.
Haigh, H. H.,	3438 N. Broad St., Phila.,	Phila.,	U. P.
Haines, W. Alberton,	Bristol,	Bucks,	U. P.
Haley, Peter,	3733 Market St., Phila.,	Phila.,	"Dentist."
Haley, Peter J.,	3733 Market St., Phila.,	Phila.,	U. P.
Hamilton, Frank A.,	DuBois,	Clearfield,	Ohio.
Hamme, John H.,	Lancaster,	Lancaster.	
Harkins, M. J.,	1032 E. Hector St., Conshohocken.	Montgomery,	U. P.
Harpel, David S.,	Penbrook,	Dauphin.	
Harper, Milton D.,	Breinigsville,	Lehigh,	N. Y. College.
Harris, Albert E.,	Speers, R. F. D. 1,	Washington.	
Harris, David B.,	Cisna Run,	Perry.	
Hartenstein, F. H.,	New Freedom,	York,	U. P.
Hartman, Guldin R.,	934 Diamond St., Phila.,	Phila.,	U. P.
Hastings, Stephen B.,	West Finley,	Washington.	
Haverly, Alexander C.,	Overton,	Bradford.	
Haverly, William D.,	Campbellsville,	Sullivan.	
Heckenberger, Henry,	Catasauqua,	Lehigh,	Ontario.
Heiser, Edward,	Pottsville,	Schuylkill.	
Helmer, Henry.	Scranton,	Lackawanna.	
Helmer, Jacob,	Scranton,	Lackawanna,	American.
Hench, Charles M.,	Waynesburg,	Greene,	U. P.
Hendren, Oliver T.,	6645 Ridge Ave., Roxborough, Phila.	Phila.,	U. P.
Hendrick, M.P .,	999 S. Park Ave., Meadville.	Crawford,	Ont. & McKillip.
Herbert, William L.,	York,	York,	U. P.
Herbott, Julius W.,	1217 N. 8th St., Phila.,	Phila.,	U. P.
Herr, John,	Manheim, R. F. D. 4,	Lancaster.	
Herron, Moore B.,	Venetia,	Washington,	U. P.
Hickman, David E.,	West Chester,	Chester,	U. P.
Hileman, W. S.,	Williamsburg,	Blair,	U. P.
Hill, Isaac C.,	Susquehanna, R. F. D. 5,	Susquehanna.	
Hillegass, Jesse Z.,	Allentown,	Lehigh,	Ontario.
Hinman, Albert W.,	415 Fourth St., Braddock,	Allegheny,	Ontario.
Hoedt, W. H.,	Philadelphia, Wissahickon,	Phila.,	U. P.
Hoffman, F. F.,	Brookville,	Jefferson,	Ontario.
Hoffman, John P.,	Gettysburg,	Adams.	
Hogg, Edwin,	Wilkes-Barre,	Luzerne,	U. P.
Holman, Abram L.,	Lewistown,	Mifflin.	
Hoover, John W.,	Chambersburg, R. F. D. 3,	Franklin.	
Horner, J. C.,	Broomall,	Delaware,	U. P.
Horst, Samuel L.,	Chambersburg, R. F. D. 3,	Franklin.	
Hoskins, Cheston M.,	3452 Ludlow St., Phila.,	Phila.,	U. P.
Hoskins, W. Horace,	3452 Ludlow St., Phila.,	Phila.,	American.
Hossler, Fred B.,	Hamburg, R. F. D. 1,	Berks.	
Houldsworth, Joseph D.,	Manayunk,	Phila.,	U. P.
Huber, Charles H.,	Rural Valley,	Armstrong,	
Hudson, E. D.,	Gettysburg,	Adams.	
Hughes, William,	Harrisburg,	Dauphin,	U. P.
Hummel, William A.,	Globe Mills,	Snyder.	
Huyett, Walter G.,	Wernersville,	Berks,	Ontario & McKillip.
Irons, Joel B.,	Erie,	Erie,	Ontario.
Ivens, W. H.,	5328 Haverford Ave., Phila.	Phila.,	U. P.
Jackson, Hazzard S.,	417 Beaver St., Sewickley,	Allegheny.	
Jacobs, Casper,	Bakersville,	Somerset.	
James, Thomas D.,	Scranton,	Lackawanna.	
Jarrett, Henry T.,	311 S. 13th St., Phila.,	Phila.,	U. P.
Jervis, Frank C.,	Edinboro,	Erie,	Ontario.
Jobson, George B., Sr.,	Franklin,	Venango.	
Johnson, Joseph,	Union Stock Yards, Lancaster.	Lancaster,	U. P.

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continued.

NAME	ADDRESS	COUNTY	COLLEGE
Johnston, Samuel H.,	2235 N. Franklin St., Phila.	Phila.,	N. Y. College.
Johnston, Walter S.,	Moore,	Delaware,	N. Y. College.
Jones, Philip K.,	327 Main St., Pittsburg,	Allegheny,	U. P.
Jones, William H.,	Millerstown,	Perry.	
Kafroth, George B.,	Honeybrook,	Chester.	
Kahle, Thomas M.,	Shippensville, R. F. D.,	Clarion.	
Kain, Charles A.,	York,	York.	
Kain, Franklin M.,	York,	York,	American.
Kane, William J.,	47 Tunnel St., Pittsburgh,	Allegheny.	
Kann, Ralph L.,	Mechanicsburg,	Cumberland,	Ont. & McKillip.
Kauffman, Harvey F.,	Shamokin,	Northumberland,	Ontario.
Kaul, William,	St. Marys,	Elk,	Ontario.
Kaup, George S.,	Boalsburg,	Centre.	
Keeler, Jesse H.,	Kulpsville,	Montgomery.	
Keelor, Allen Z.,	Telford,	Montgomery,	Ontario.
Keelor, J. Rein,	Harleysville,	Montgomery,	Ontario.
Keely, Horace P.,	Schwenksville,	Montgomery,	U. P.
Keepers, Robt. W.,	Greencastle,	Franklin,	Kansas City.
Keck, Morris W,.	Slatington,	Lehigh,	Ontario.
Keim, Samuel C.,	Bethlehem,	Northampton.	
Keller, David M.,	Williamsport,	Lycoming,	Ontario.
Kellner, Edward L.,	Phila., Phila. Bourse,	Phila.,	U. P.
Kelly, Thomas,	1204 Pine St., Phila.,	Phila.,	U. P.
Kendig, Alfred,	Safe Harbor, R. F. D. 1,	Lancaster.	
Kernick, James H.,	Wilkinsburg,	Allegheny,	U. S. College.
Kiethline, John T.,	East Stroudsburg,	Monroe,	Ontario.
Kimball, Victor G.,	39th & Woodland Ave., Phila.	Phila.,	N. Y. College.
Kime, John T.,	Cherry Tree,	Indiana.	
King, Green B.,	Scullton,	Somerset.	
King, Ross R.,	Rockwood, R. F. D. 3,	Somerset.	
Kingan, John C.,	4082 Liberty Ave., Pittsburgh.	Allegheny,	Ontario.
Kipe, Joseph, Sr.,	Williamsburg, R. F. D. 1,	Blair.	
Klein, Fred S.,	Shenandoah,	Schuylkill,	U. P.
Klein, Louis A.,	39th & Woodland Ave., Phila.	Phila.,	U. P..
Kline, Harry E.,	York,	York.	
Kline, John J.,	Danville,	Montour,	Ontario.
Koehler, Edward F..	Easton,	Northampton,	American.
Koehler, Theodore J.,	Easton,	Northampton.	
Kohler, Daniel R.,	Boyertown,	Berks,	Ontario.
Koller, Obadiah L.,	Myerstown,	Lebanon.	
Koontz, Royal B.,	Johnstown,	Cambria,	U. P.
Korbb, Adam F.,	Venus,	Venango.	
Kramlich, Richard L.,	Fogelsville,	Lehigh,	Ontario.
Kruger, Wilhelm,	Zionsville,	Lehigh.	
Kuder, Eugene E.,	Mahanoy City,	Schuylkill.	
Kuehner, Mellis E.,	1424 Chew St., Allntown,	Lehigh,	U. P.
Kuhn, John M.,	Mercersburg,	Franklin,	Ontario.
Kuhns, William H.,	Ardmore,	Montgomery.	
Laberge, Charles Z.,	Beaver Falls,	Beaver,	Montreal.
Landis, Tobias E.,	New Berlinville,	Berks.	
Lantz, George K.,	Sabula,	Clearfield,	U. S. College.
Larzelere, Samuel D.,	Jenkintown,	Montgomery,	U. P.
Lee, Wm. J.,	3613 Haverford Ave., Phila.	Phila.,	U. P.
Leber, Jacob G.,	Ephrata,	Lancaster.	
Lehman, Pius A.,	York,	York.	
Leighton, Harry F.,	Union Stock Yards,	Allegheny,	U. P.
Lenhart, Charles,	York,	York,	Columbian.
Lenhart, Matthias P.,	Irwin,	Westmoreland.	
Lentz, Frank E.,	3715 Woodland Ave., U. of P.	Phila.,	U. P.
Lentz, William J.,	39th St. & Woodland Ave., Phila.	Phila.,	U. P.
Lesher, John L.,	Chambersburg, R. F. D. 2,	Franklin.	
Leutholt, Henry,	Taylor,	Lackawanna,	Chicago.
LeVan, David B.,	Kutztown,	Berks,	Chicago.
Lidstone, Vance R.,	Honesdale,	Wayne,	U. P.
Lienhardt, Richard P.,	Wayne,	Delaware,	U. P.
Linberg, J. Wm.,	1723 N. 55th St., Phila.	Phila.,	U. P,
Linderman, P. C.,	Mifflinburg,	Union,	U. P.
Lintz, Charles,	Chester,	Delaware,	U. P.
Loller, Jesse G.,	Kennett Square, R. F. D. 3.	Chester.	

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continued.

NAME	ADDRESS	COUNTY	COLLEGE
Longacre, Edwin D.,	Shenandoah,	Schuylkill,	Ontario.
Longacre, William S.,	Sittler,	Schuylkill,	Ontario.
Longenecker, Abraham,	Manheim,	Lancaster.	
Longenecker, William,	Lititz,	Lancaster,	Ontario.
Lossie, Fred H.,	Monessen,	Westmoreland,	Chicago.
Lutes, Emory,	Wilkes-Barre,	Luzerne,	McKillip.
Lutz, Charles V.	Perryopolis,	Fayette,	Ont. & McKillip.
Lutz, Nathaniel F.,	Tulpehocken,	Berks.	
Lynaugh, William,	Pottsville,	Schuylkill.	
Lynett, J. F.,	Scranton,	Lackawanna,	U. P.
Lyter, Emanuel W.,	Berrysburg,	Dauphin.	
MacColey, Thomas,	Carnegie,	Allegheny.	
MacFayden, John,	5215 Reinhart St., Phila.,	Phila.	
Mackey, Daniel M.,	Cameron,	Greene.	
Magee, George,	Uniontown,	Fayette.	
Maher, John J.,	1336 Marshall St., Phila.,	Phila.,	U. P.
Mancill, D. D.,	Downingtown,	Chester,	U. P.
Manges, Abram B.,	Schellsburg, R. F. D. 1,	Bedford.	
Mansbach, Louis A.,	1515 Franklin St., Phila.,	Phila.	
Marlin, Edgar,	329 E. Lehigh Ave., Kensington, Phila.	Phila.,	U. P.
Marshall, Clarence J.,	5031 Pine St., Phila.,	Phila.,	U. P.
Marshall, Leslie G.,	Towanda,	Bradford,	U. P.
Martien, Henry D.,	735 N. 43d St., Phila.,	Phila.,	U. P.
Martin, David,	1218 Walnut St., McKeesport.	Allegheny.	
Martin, David G.,	Lancaster,	Lancaster.	
Martin, Edward,	6025 Station St., Pittsburgh.	Allegheny,	Royal.
Massinger, Eber M.,	Phoenixville,	Chester,	N. Y. College.
Massinger, Wesley,	Chalfont,	Bucks,	N. Y. College.
Mather, John W.,	Berwick,	Columbia,	Ontario.
Mathues, S. W.,	433 W. Miner St., West Chester.	Chester,	N. Y. College.
Matthews, Frank V.,	217 Ninth Ave., McKeesport.	Allegheny,	Chicago.
Mattson, William H.,	Chester Heights,	Delaware,	U. P.
May, Alfred R.,	Boiling Springs,	Cumberland.	
Mayer, F. B.,	Canton,	Bradford,	McKillip.
McAnulty, John F.,	2832 N. Sixth St., Phila.,	Phila.,	U. P.
McAnulty, James T.,	1445 S. Eighth St., Phila.,	Phila.	
McBreen, Philip L.,	New Kensington,	Westmoreland,	Grand Rapids.
McCarthy, Frank H.,	Pottsville,	Schuylkill,	Ontario.
McCloskey, Anthony J.,	Chestnut Hill, Phila.,	Phila.,	U. P.
McCloskey, James A.,	39th St. & Woodland Ave., Phila.	Phila.,	U. P.
McClure, Floyd I.,	Dunkard,	Greene,	Geo. Washington.
McClure, Fred K.,	Dunkard,	Greene,	Geo. Washington.
McCurdy, C. L.,	Creekside,	Indiana,	Grand Rapids.
McDonough, J. F.,	3061 Richmond St., Phila.,	Phila.,	U. P.
McGinnis, Wm.,	Emlenton, R. F. D. 65,	Venango.	
McGroarty, Wm. V.,	Boothwyn,	Delaware,	U. P.
McGugan, James,	1626 Park Ave., Phila.,	Phila.	
McKenna, Charles S.,	Washington,	Washington,	Chicago.
McKibbin, D., Jr.,	2900 Frankford Ave., Phila.	Phila.,	U. P.
McKibbin, Robert W.,	Waynesboro,	Franklin,	Ontario.
McKinley, Stephen R.,	Elk Lick,	Somerset.	
McKissick, William G.,	Millersburg,	Dauphin.	
McLean, C. C.,	Meadville,	Crawford.	Ontario.
McMillen, William,	Home, R. F. D. 1.	Indiana,	
McMillen, Sylvester S.,	Spring Boro., R. F. D. 36.	Crawford.	
McMullen, Hugh H.,	Linesville,	Crawford.	
McNeal, Frank J.,	Wilkes-Barre,	Luzerne,	Ontario.
McNeal, Harry T.,	Sunbury,	Northumberland,	Ontario.
McNeal, Peter N.,	Shamokin,	Northumberland,	Ontario.
McNeil, James C.,	3349 Webster Ave., Pittsburgh.	Allegheny,	U. P.
Meade, Louis E.,	Tunkhannock,	Wyoming,	Columbian.
Meckley, Urias L.,	Littlestown,	Adams.	
Meiser, William A.,	Newport,	Perry,	Ontario & McKillip.
Mertz, Peter J.,	Honeybrook,	Chester,	Ontario.
Metzgar, Abram H.,	Millersville.	Lancaster,	U. P.
Michener, Hiram M.,	3722 N. Broad St., Phila.,	Phila.,	U. P.

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continued.

NAME	ADDRESS	COUNTY	COLLEGE
Miller, Charles H.,	Duncannon,	Perry,	U. P.
Miller, Daniel S.,	1017 S. 47th St., Phila.,	Phila.,	U. P.
Miller, F. B.,	Brooklyn,	Susquehanna,	Ontario.
Miller, Franklin W.,	Sinking Spring, R. F. D. 2.	Berks.	
Miller, Harvey H.,	Rebersburg,	Centre.	
Miller, John P.,	Reading,	Berks,	U. P.
Miller, Pierce M.,	Sinking Spring, R. F. D. 2.	Berks.	
Miller, Samuel S.,	Aspers,	Adams.	
Milroy, Andrew L.,	Evans City,	Butler,	Ontario.
Minich, Benamin F.,	Columbia,	Lancaster,	U. P.
Mitchell, Adrian J.,	Erie,	Erie,	Ontario.
Mitchell, Adrian J., Jr.,	Erie,	Erie,	Chicago.
Mitchell, Harry B.,	Wellsboro,	Tioga,	U. P.
Mitterling, Ira,	Sunbury,	Northumberland,	U. P.
Mock, William,	Easton,	Northampton,	Ontario.
Monroe, Franklin,	Plymouth,	Luzerne.	
Montgomery, Anthony,	Elderton,	Armstrong.	
Moore, John M.,	Danville, R. F. D. 3,	Montour.	
Moore, Joseph W.,	Waynesboro,	Franklin.	
Morette, E. M. C.,	Carlisle,	Cumberland,	U. S. College.
Morgan, Warren B.,	Norristown,	Montgomery,	U. P.
Moriarty, Michael,	Gettysburg,	Adams.	
Morris, Franklin S.,	Revere,	Bucks,	N. Y. American.
Moyer, Calvin W.,	Quakertown,	Bucks,	U. P.
Moyer, Enos S.,	Perkasie,	Bucks,	N. Y. College.
Moyer, Henry B.,	Alburtis, R. F. D. 2,	Lehigh.	
Moyer, H. Clayton,	Blooming Glen,	Bucks,	U. P.
Moyer, J. W.,	Sunbury, R. F. D. 3,	Northumberland.	
Moyer, Samuel C.,	Carbondale,	Lackawanna.	Ontario.
Moyer, Theodore W.,	Siegfried,	Northampton,	American.
Moyer, Vincent C.,	Southampton,	Bucks,	U. P.
Moyer, William H.,	Mechanicsburg,	Cumberland,	Ontario.
Muir, E. Stanton,	2145 N. Second St., Phila.,	Phila.,	U. P.
Mumma, Richard T.,	Hanover,	York,	Columbian.
Munce, T. Edward,	Harrisburg,	Dauphin,	U. P.
Murphy, Patrick F.,	1607 N. Fourth St., Phila.,	Phila.	
Myers, George A.,	Albion, R. F. D. 1,	Erie.	
Neff, William H. C.,	2211 N. Second St., Phila.,	Phila.,	N. Y. College.
Nester, Jacob B.,	Frederick,	Montgomery.	
Neuhaus, Chas. Owen,	Glen Rock,	York,	U. P.
Newcomer, Christian,	Henrietta,	Blair.	
Newcomer, Ezra W.,	Mount Joy,	Lancaster,	U. P.
Newhard, Irwin C.,	Ashland,	Schuylkill,	N. Y. College.
Newton, Charles,	1220 Locust St., Phila.,	Phila.,	U. P.
Nice, Frank K.,	3514 N. 15th St., Tioga, Phila.	Phila.,	American.
Nice, William H.,	6212 Baynton St., Germantown, Phila.	Phila.,	American.
Nick, Charles W.,	Erie,	Erie.	
Nicholas, David E.,	6 Seneca St., Pittsburgh,	Allegheny.	
Nicholas, William S.,	Bedminster,	Bucks,	Columbian.
Nicholson, Samuel J.,	3159 Belgrade St., Phila.,	Phila.,	U. P.
Nicholson, William,	1313 Boyle St., Allegheny,	Allegheny,	Ontario.
Nissley, S. M.,	Bellefonte,	Centre,	U. P.
Noack, Otto G.,	Reading,	Berks,	Berlin.
Noll, Lawrence G.,	Annville, R. F. D. 2,	Lebanon.	
Norton, Elwin S.,	Meadville, Box 233,	Crawford,	U. P.
Nugent, Thomas F.,	New Castle,	Lawrence,	Ontario.
Oat, Charles F.,	West Chester,	Chester,	U. P.
Olding, Frank R.,	2315 E. Susquehanna Ave., Phila.	Phila.,	U. P.
Olweiler, Jacob F.,	Elizabethtown,	Lancaster,	McKillip.
Ormiston, Adam W.,	102 Herman St., Germantown, Phila.	Phila.,	American.
Osborne, Russell,	Peckville,	Lackawanna,	N. Y. College.
Osler, Horace N.,	Dushore,	Sullivan,	Ontario.
Oyler, John H.,	Harrisburg,	Dauphin,	Ontario.
Paget, Harry A.,	Scranton,	Lackawanna,	Ontario.
Palmer, Clinton B.,	Easton,	Northampton,	Chicago.
Palmer, Daniel W.,	Canonsburg, R. F. D. 5,	Washington,	
Parker, E. A.,	1940 S. 13th St., Phila.,	Phila.,	U. P.
Parker, Walter C.,	Clark's Summit, R. F. D. 1.	Lackawanna,	U. P.

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continued.

NAME	ADDRESS	COUNTY	COLLEGE
Patrick, Murray E.,	Greensburg,	Westmoreland,	U. P.
Patterson, James,	Bristol,	Bucks.	
Paxson, William H.,	Marietta,	Lancaster,	U. P.
Pease, W. W.,	Meadville,	Crawford,	Chicago.
Perdue, W. M.,	Beaver Falls,	Beaver,	Ont. & McKillip.
Pettibon, David F.,	Burgettstown,	Washington.	
Petersheim, Samuel M.,	Morgantown,	Berks.	
Pfarr, A. W.,	202 Cedar St., Pittsburgh,	Allegheny,	Ontario.
Phelan, Richard M.,	Sharon,	Mercer,	Ontario.
Phillips, George S.,	Newmanstown,	Lebanon.	
Phillips, Isaac B.,	5631 Market St., Phila.,	Phila.	
Phillips, J. R.,	Library,	Allegheny.	
Phillips, John R.,	North East,	Erie.	
Phipps, William P.,	Wilkes-Barre,	Luzerne,	U. P.
Piersol, Warren R.,	New Holland,	Lancaster,	U. P.
Pifer, William J.,	Punxsutawney, R. F. D. 3,	Jefferson.	
Porter, Edmund C.,	New Castle,	Lawrence,	Ontario.
Potteiger, Alber B.,	Selinsgrove,	Snyder,	Ontario.
Powell, Edgar W.,	Bryn Mawr,	Montgomery,	U. P.
Prather, John V.,	Titusville,	Crawford,	American.
Price, Benjamin,	West Chester,	Chester,	U. P.
Price, Samuel G.,	Doylestown,	Bucks.	
Price, Samuel H.,	Collegeville,	Montgomery,	
Prothero, William B.,	Johnstown,	Cambria,	N. Y. College.
Purington, B. M.,	Corry,	Erie.	
Quarll, Joseph T.,	Avondale,	Chester,	U. P.
Quigley, R. M.,	Coudersport,	Potter,	U. P.
Quinn, T. J.,	Darby,	Delaware,	U. P.
Radley, Aaron W.,	Bethlehem,	Northampton,	American.
Ralston, Lewis,	Phoenixville,	Chester.	
Record, Edward,	Glenholden,	Delaware,	U. P.
Rectenwald, Nicholas,	11 Arlington Ave.,	Allegheny.	
Reed, J. Orville,	Danville,	Montour,	Ontario.
Reichel, John,	Media,	Delaware,	U. P.
Reid, Walter,	Shadeland,	Crawford.	
Reifsnyder, I. S.,	Collegeville,	Montgomery,	U. P.
Reinert, Daniel E.,	Nazareth,	Northampton,	U. P.
Reish, Samuel,	Pleasant Gap,	Centre.	
Rentschler, M. D.,	Punxsutawney,	Jefferson,	McKillip.
Reynolds, Howard C.,	Factoryville,	Wyoming,	Ohio.
Reynolds, Roy,	Elkland,	Tioga,	Grand Rapids.
Rhoads, Warren L.,	Lansdowne,	Delaware,	American.
Rice, Horace,	Union City,	Erie.	
Richards, H. S.,	6328 Penn Ave., Pittsburgh.	Allegheny,	Ontario.
Richards, John,	Eldorado,	Blair.	
Richards, John L.,	65 Hanover St.,	Pottstown,	Montgomery.
Ridge, William H.,	Trevose,	Bucks,	U. P.
Riggel, Joseph J.,	Loretto,	Cambria.	
Rile, Edward A.,	Blue Bell,	Montgomery,	U. P.
Riley, Garrie W.,	New Hope,	Bucks,	U. P.
Ritter, Albert B.,	Pennsburg,	Montgomery,	Ontario.
Rivers, Reuben,	Lansdale,	Montgomery,	U. P.
Roberts, Owen B.,	Blandon,	Berks.	
Robison, Ephraim,	Steckman,	Bedford.	
Robison, Reynolds,	Piney Creek,	Bedford.	
Rockey, Wm. A.,	Punxsutawney,	Jefferson,	Chicago.
Rogers, H. G.,	Washington,	Washington.	
Rook, Willard G.,	Selinsgrove,	Snyder.	
Rosenberger, J. N.,	Wycombe,	Bucks,	U. P.
Ross, James T.,	4818 Frankford Av., Frankford, Phila.	Phila.	
Roxberry, George W.,	3618 N. 16th St., Tioga, Phila.	Phila.	
Royer, David R.,	Jamestown,	Mercer,	Ontario.
Royer, M. B.,	Leola,	Lancaster,	U. P.
Ruch, H. E.,	Portland,	Northampton,	U. P.
Ruhl, John S.,	Tylersville,	Clinton.	
Ruhl, Jonathan,	Tylersville,	Clinton.	
Rushworth, Edward,	Malvern,	Chester.	
Ryder, Daniel,	Chambersburg,	Franklin,	Ontario.
Sallade, J. G.,	Benton,	Columbia,	Ontario.
Sallade, James W.,	Auburn,	Schuylkill,	Ontario.
Salmon, Henry,	Shippensburg,	Cumberland.	
Sands, Harry G.,	Benton,	Columbia,	Ontario.
Saxe, D. M.,	925 Carpenter St., Phila.,	Phila.,	U. P.

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continued.

NAME	ADDRESS	COUNTY	COLLEGE
Saylor, Joseph,	Fayetteville,	Franklin.	
Schaeffer, James D.,	Fleetwood,	Berks.	
Schaeffer, Jno. H.,	Pine Grove, R. F. D. 2,	Schuylkill.	
Schaeffer, Nicholas L.,	Fleetwood,	Berks,	Chicago.
Schall, Henry B.,	Kittanning, R. F. D. 3,	Armstrong.	
Schantz, A. L.,	Allentown, R. F. D. 1,	Lehigh.	
Schaufler, Charles A.,	1338 Hunting Park Ave., Phila.	Phila.,	Royal.
Schleicher, Frank L.,	Riegelsville,	Bucks.	
Schmoyer, Albert H.,	Boyertown,	Berks,	Chicago.
Schneider, Frederick H.,	Old York Rd. & Erie Ave., Phila.	Phila.,	Columbian.
Schreffler, Aaron,	Berrysburg,	Dauphin.	
Schreiber, Albert F.,	62d St. & Elmwood Ave., Phila.	Phila.,	U. P.
Schuey, Geo. B.,	East Brady,	Clarion,	Ontario.
Schwartz, Geo. A.,	Flat Iron Bldg., Altoona,	Blair,	U. P.
Schwindt, Ambrose E.,	Silver Creek,	Schuylkill.	
Sebastian, George B.,	Rehrersburg,	Berks.	
Seidel, Edward,	Bryn Mawr,	Montgomery,	U. P.
Seitter, Joseph B.,	1817 E. Tioga St., Phila.,	Phila.,	U. P.
Seitz, Elmer E.,	Glen Rock,	York,	Columbian.
Seitzinger, William H.,	Wernersville,	Berks.	
Seil, John,	Hollidaysburg, R. F. D. 3,	Blair.	
Senseman, Benjamin F.,	1723 N. 55th St., Phila.,	Phila.,	U. P.
Service, Don C.,	Butler,	Butler,	Grand Rapids.
Shaffer, William H.,	Progress,	Dauphin.	
Sheffer, John A.,	Bair,	York.	
Sherrick, Franklin N.,	Connellsville.	Fayette,	Ontario.
Shiffert, John,	Chambersburg,	Franklin.	
Shiffert, John C., Jr.,	Chambersburg,	Franklin,	N. Y. College.
Shively, William G.,	Lamartine,	Clarion,	Ontario.
Shook, Warren B.,	Greencastle,	Franklin,	U. P.
Shoemaker, Henry C.,	1718 Wallace St., Phila.,	Phila.,	N. Y. College.
Shoemaker, Lucas E.,	East Texas,	Lehigh.	
Shue, F. F.,	Hellam, R. F. D. No. 1,	York,	U. P.
Shugar, Harry B.,	Lebanon,	Lebanon,	American.
Sieber, Cyrus,	Mifflintown,	Juniata.	
Sill, Joseph E.,	Union City, R. F. D. 5,	Erie.	
Simmons, Jacob W.,	Mechanicsburg, R. F. D. 6.	Cumberland.	
Simpson, Ernest L.,	Knoxville,	Tioga,	N. Y. College.
Sitterly, Charles M.,	Scranton,	Lackawanna.	
Sitterly, John R.,	Scranton,	Lackawanna,	Ontario.
Slaughter, William T.,	Bristol,	Bucks.	
Sloan, Lewis D.,	Conneautville,	Crawford.	
Smith, Albert N.,	1926 Camac St., Phila.,	Phila.,	U. P.
Smith, Clement V.,	West Newton, R. F. D. 1,	Westmoreland.	
Smith, G. F.,	Hughesville,	Lycoming,	U. P.
Smith, Jeremiah,	Lawsonham, R. F. D. 1.	Clarion.	
Smith, John D.,	Dallastown,	York.	
Smith, O. P.,	Greensburg, R. F. D. 4,	Westmoreland.	
Smith, William F.,	Renfrew, R. F. D. 29,	Butler.	
Smith, Wm. J.,	Stillwater,	Columbia.	
Snow, William C.,	Petrolia, R. F. D. 73,	Butler.	
Snyder, Joseph G.,	Jackson Centre, R. F. D. 17.	Mercer.	
Snyder, Noah S.,	Colmar,	Montgomery.	
Snyder, Owen W.,	Lehighton,	Carbon,	Ontario.
Snyder, S. David,	Mercer, R. F. D. 1,	Mercer.	
Sommer, H. L.,	518 N. 5th St., Phila.,	Phila.,	U. P.
Spangler, William H.,	Lewisberry,	York.	
Speck, A. Harvey,	Fredericksburg,	Lebanon.	
Spencer, A. H.,	Girard,	Erie,	U. P.
Spicer, Charles A.,	Coraopolis,	Allegheny,	Ontario.
Spitz, Arthur,	3216 Columbia Ave., Phila.	Phila.,	U. P.
Springer, Charles W.,	Uniontown,	Fayette,	U. P.
Staley, Raymon M.,	Camp Hill,	Cumberland,	U. P.
Stambaugh, John,	Spring Grove, R. F. D. 3,	York.	
Stambaugh, Nathan,	Hanover,	York.	
Standen, Frank,	1220 Locust St., Phila.,	Phila.	
Stark, Marcus W.,	Tunkhannock,	Wyoming,	Chicago.
Stark, Theron R.,	Mill City,	Wyoming.	
Stauffer, Willis B.,	1300 N. 28th St., Phila.,	Phila.,	U. P.
St. Clair, James H.,	Indiana,	Indiana.	
Stehle, Fred, Jr.,	4270 Ridge Ave., Manayunk, Phila.	Phila.,	U. P.
Stein, Howard L.,	Emaus,	Lehigh,	Ontario.

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continued.

NAME	ADDRESS	COUNTY	COLLEGE
Sterner, Conrad D.,	Codorus,	York.	
Stevens, Elwood B.,	301 Earlham Terrace, Gtn., Phila.	Phila.	
Stickles, Samuel,	English Centre,	Lycoming.	
Stoker, Hilbert S.,	Wilkes-Barre,	Luzerne,	U. P.
Stone, Chas. E.,	Westfield,	Tioga,	Grand Rapids.
Storm, William H.,	753 Bourse Bldg., Phila.,	Phila.,	U. P.
Stover, John F.,	Fredericksburg,	Lebanon.	
Stover, John P.,	Greencastle,	Franklin,	Ontario.
Stover, Mahlon G.,	Nazareth,	Northampton,	Ontario.
Strang, Frank,	Westfield,	Tioga.	
Strayer, W. M.,	Lancaster,	Lancaster.	
Strickler, Charles M.,	Greencastle,	Franklin,	Ontario.
Strickler, J. E.,	Chambersburg, R. F. D. 2,	Franklin,	U. S. College.
Stubbs, E. L.,	Oxford,	Chester,	U. P.
Stull, D. D.,	Johnstown, R. F. D. 2,	Cambria.	
Super, Daniel H.,	Warrensville,	Lycoming,	Ontario.
Sutton, Bruce S.,	Wilkes-Barre,	Luzerne.	
Swank, George K.,	East Mauch Chunk,	Carbon,	U. P.
Swartz, Levi B.,	Wismer,	Bucks.	
Sweely, Elmer E.,	Williamsport,	Lycoming,	Ontario.
Sypher, Henry J.,	Allenwood, R. F. D. 1,	Union.	
Tallman, Bertram H.,	Williamsport,	Lycoming,	U. P.
Taylor, Frederick,	Pulaski,	Lawrence,	U. P.
Taylor, Robert E.,	Windham,	Bradford,	U. P.
Temple, S. W.,	Allens Mills,	Jefferson.	
Terry, Addison J.,	Pittston,	Luzerne,	Ontario.
Terry, Edward E.,	2830 Welsh Rd., Holmesburg, Phila.	Phila.,	U. P.
Terry, Harry C.,	Langhorne,	Bucks,	American.
Thomas, Wilson C.,	Marion Centre,	Indiana.	
Thompson, William C.,	Berwyn,	Chester.	
Timberman, J. H.,	Wilkes-Barre,	Luzerne.	
Timblin, Ward N.,	Indiana,	Indiana,	Chicago.
Tintsman, John Z.,	335 E. Girard Ave., Phila.,	Phila.,	U. P.
Tomlinson, William J.,	Williamsport,	Lycoming,	American.
Tower, Elmer E.,	Hallstead,	Susquehanna,	Columbian.
Turner, Henry W.,	New Hope,	Bucks,	U. P.
Turner, John H.,	Wellsboro,	Tioga,	U. P.
Tyler, Thomas B.,	Marysville,	Perry.	
Uibel, Charles B.,	Terre Hill,	Lancaster,	Columbian.
Ullery, A. J.,	Scenery Hill, R. F. D. 3,	Washington.	
Ullery, W. H.,	Scenery Hill, R. F. D. 3,	Washington.	
Ulsh, Henry M.,	Lewistown, R. F. D. 2,	Mifflin.	
Underhill, Benjamin M.,	Media,	Delaware,	U. P.
Urey, H. M.,	Fredonia,	Mercer.	
Van Buskirk, G. T.,	Willow Grove,	Montgomery,	U. P.
VanCise, George B.,	Athens, R. F. D. 26,	Bradford.	
Vansant, Joseph W.,	500 Rhawn St., Fox Chase, Phila.	Phila.,	U. P.
Vasey, J. Price,	23 School Lane, Phila.,	Phila.	
Wadel, Samuel,	Shippensburg, R. F. D. 4,	Franklin.	
Wagner, F. A.,	1429 N. Felton St., Phila.,	Phila.,	U. P.
Waidner, Charles J.,	Hellertown,	Northampton,	N. Y. College.
Walls, John J.,	829 Dauphin St., Phila.,	Phila.	
Wallace, Samuel J.,	Warren,	Warren,	Ontario.
Waldron, Thomas M.,	Uniontown,	Fayette,	Ontario.
Waldron, R. M.,	Greensburg,	Westmoreland,	Ontario.
Walter, Charles R.,	Hazleton,	Luzerne,	U. P.
Ware, James T.,	31st & Penn Ave., Pittsburgh.	Allegheny,	U. P.
Wasser, Charles,	Durham,	Bucks.	
Washburn, Silas S.,	Wellsboro,	Tioga.	
Waugh, David,	West Finley, R. F. D. 2,	Washington,	Indiana.
Waugh, James A.,	1046 5th Ave., Pittsburgh.	Allegheny,	Ontario.
Waugh, William J.,	Washington,	Washington,	Ontario.
Weamer, Silas C.,	Indiana,	Indiana.	
Weaver, Victor B.,	Coopersburg,	Lehigh.	
Webb, William T.,	Quarryville,	Lancaster,	U. P.
Weber, Samuel E.,	Lancaster,	Lancaster,	Ontario.
Webster, Richard G.,	Chester,	Delaware,	U. P.
Wehr, Grant A.,	Denver,	Lancaster,	Ont. & McKillip.
Weigel, John,	York Springs, R. F. D. 4,	Adams.	
Weikel, Lemuel,	Watsontown,	Northumberland.	
Weinberg, Herman H.,	2250 N. 21st St., Phila.,	Phila.,	U. P.

LIST OF LICENSED VETERINARIANS IN PENNSYLVANIA—Continued.

NAME	ADDRESS	COUNTY	COLLEGE
Well, John B.,	Terre Hill,	Lancaster.	
Weller, John O.,	Meyersdale,	Somerset.	
Welliver, George H.,	Bloomsburg,	Columbia,	Ontario.
Welsh, Samuel G.,	Drifton,	Luzerne,	U. P.
Wenner, George,	Knox, R. F. D. 1,	Clarion.	
Werley, C. Daniel,	Jordan,	Lehigh,	Ohio.
Werley, Kirby D.,	Hamburg,	Berks,	McKillip.
Werntz, William T. S.,	Media,	Delaware,	U. P.
Werntz, Harvey G.,	3734 Locust St., Phila.,	Phila.,	U. P.
Wheeler, Joseph J.,	Sugar Grove, R. F. D. 4,	Warren.	
Whitaker, Charles J.,	Girard,	Erie.	
White, W. G.,	Lansdowne,	Delaware,	U. P.
Whiteman, Harry J.,	Latrobe,	Westmoreland,	U. P.
Whiting, Isaac N.,	Mansfield,	Tioga.	
Whitling, William H.,	Knox,	Clarion.	
Widmer, E. W.,	529 Adams Ave., Scranton,	Lackawanna.	
Wieand, Edwin,	Macungie,	Lehigh.	
Wieand, Victor H.,	Allentown,	Lehigh.	
Wier, Arthur W.,	Greenville,	Mercer,	Ohio.
Wight, Allen C.,	237 McKee Place., Pittsburgh.	Allegheny,	Ohio.
Wight, Willard E.,	237 McKee Place, Pittsburgh.	Allegheny,	Ontario.
Wilcox, Parris,	Covington,	Tioga.	
Wiley, Andrew M.,	Delta, R. F. D. 4,	York.	
Wilke, Theodore E.,	Beaver Falls,	Beaver,	Kansas City.
Wilkins, Charles,	Union City, R. F. D. 3,	Erie.	
Will, Samuel,	Bainbridge, R. F. D. 1,	Lancaster.	
Will, Horace T.,	Elizabethtown, R. F. D. 1,	Lancaster.	
Willard, Samuel B.,	Yardley,	Bucks,	U. P.
Williams, Charles,	1321 Thompson St., Phila.,	Phila.,	U. P.
Wilson, Samuel,	Somerfield,	Somerset.	
Wilson, William M.,	Hartstown,	Crawford	Ontario.
Wilson, W. Howard,	Roslyn,	Montgomery,	N. Y. College.
Wiltraut, Frank A.,	Wilkes-Barre,	Luzerne,	Ontario.
Windle, Waverly A.,	Kennett Square,	Chester,	U. P.
Winner, Harry S.,	Clearfield,	Clearfield,	U. P.
Winstanley, John H.,	3400 Spruce St., Phila.,	Phila.,	U. P.
Winter, Emanuel A.,	York,	York.	
Wise, J. Houston,	Time,	Greene.	
Witmer, Hervey W.,	Shippensburg,	Cumberland,	Ontario.
Witmer, John M.,	Lancaster,	Lancaster.	
Woodward, James A.,	Shinglehouse,	Potter,	Ontario.
Woodward, Frank J.,	Media,	Delaware,	U. P.
Wright, Harry S.,	Latrobe,	Westmoreland.	
Yeagle, Joseph C.,	Warrensville,	Lycoming.	
Yingst, Henry,	Annville, R. F. D. 2,	Lebanon.	
Yoder, E. C.,	Allentown,	Lehigh,	Ontario.
Young, George J.,	Coatesville,	Chester,	Ontario.
Young, S. Taylor,	Oxford,	Chester,	U. P.
Yunker, Elkan H.,	2344 N. 18th St., Phila.,	Phila.,	U. P.
Zellers, Isaac W.,	Harrisburg,	Dauphin.	
Zurkow, M. L.,	Jersey Shore,	Lycoming,	U. P.

VETERINARIANS OUT OF THE STATE

NAME	ADDRESS	COUNTY	COLLEGE
Barrett, Lawrence F.,	Chicago, Ill.,		Chicago.
Benner, Willis G.,	Wash., D. C., Bureau of Animal Industry.		Ontario.
Black, Horace G.,	Hammonton, N. J.,		U. P.
Cecil, Joseph D.,	Pearl River, N. Y.,		U. P.
Deegan, William J.,	Burlington, N. J.,		U. P.
Dennis, Guy H.,	Perryville, Md.,		U. P.
Dolan, James T.,	631 Union Ave., New York,		U. P.
Donnelly, Jas. R.,	4320 Emerald St., Chicago, Ill.		Ontario-McKillip.
Fairley, James,	Burlington, N. J., R. F. D. 3.		U. P.
Freyman, Calvin A.,	711 14th St., E. E. Washington, D. C.		U. S. College.
Greisemer, S. F.,	Helena, Montana,		U. P.
Hassiock, August E.,	New York City,		N. Y. College.
Hoopes, Herbert,	Bel Air, Md.,		U. P.
Hopper, John G.,	Columbus, Ohio,		U. P.
Hoskins, H. Preston,	St. Paul, Minn.,		U. P.
Houchin, Arthur S.,	Newark, Del.,		U. P.
Jones, Frederic S.,	Ithaca, N. Y.,		U. P.
Kershner, Peter I.,	Dodge City, Kansas,		Ontario.
Labash, Charles,	Passaic, N. J.,		Kansas City.
Mahon, James,	Washington, D. C.,		Kansas City.
Millar, Harry C.,	Asbury Park, N. J.,		U. P.
Peter, Henry W.,	14th Cav., U. S. A., P. I.		American.
McPherson, William B.,	Republic, Wash.		
Purcell, Patrick J.,	Tulsa, Oklahoma,		Ontario.
Reeder, Walter C.,	Rising Sun, Md.,		U. P.
Schneider, Harry A.,	Baltimore, Md.,		U. P.
Walter, Harry K.,	Richmond, Va.,		U. P.
Wescott, Henry B.,	Portland, Me.,		U. P.
Wilkinson, W. Atkinson,	Los Angeles, Cal.,		U. P.

VETERINARIANS OF THE STATE BY COUNTIES

ADAMS COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Biggs, William M.,	Gettysburg.	
Culp, Francis R.,	Arendtsville.	
Deardorff, J. A.,	Biglerville, R. F. D. 3.	
Feiser, Robert P.,	East Berlin.	
Hoffman, John P.,	Gettysburg.	
Hudson, E. D.,	Gettysburg.	
Meckley, Urias L.,	Littlestown.	
Miller, Samuel S.,	Aspers.	
Moriarty, Michael,	Gettysburg.	
Weigel, John,	York Springs, R. F. D. 4.	

ALLEGHENY COUNTY

Ardary, Robert W.,	Pittsburgh, Penn Ave. & 31st St.,	Ontario.
Atorthy, N. C.,	Carnegie,	Bengal & Ohio.
Boyd, Charles W.,	Pittsburgh, North Side,	U. P.
Eyman, John O.,	McKeesport, 616 Fifth Ave.	
Gearhart, D. C.,	East Liberty, 215 South St.,	American.
Gratz, Oscar H.,	Pittsburgh, 1844 Centre Ave.,	U. S. College.
Gunner, Benj.,	Sewickley,	U. P.
Hinman, Albert W.,	Braddock, 415 Fourth St.,	Ontario.
Jackson, Hazzard S.,	Sewickley, 417 Beaver St.	
Jones, Philip K.,	Pittsburgh, 327 Main St.,	U. P.
Kane, William J.,	Pittsburgh, 47 Tunnel St.	
Kernick, James H.,	Wilkinsburg,	U. S. College.
Kingan, John C.,	Pittsburgh, 4082 Liberty Ave.,	Ontario.
MacColey, Thomas,	Carnegie.	
McNeil, James C.,	3349 Webster Ave., Pittsburgh,	U. P.
Martin, David,	McKeesport, 1218 Walnut St.	
Martin, Edward,	Pittsburgh, E. E., 6025 Station St.,	Royal.
Matthews, Frank V.,	McKeesport, 217 Ninth Ave.,	Chicago.
Nicholas, David E.,	Pittsburgh, 6 Seneca St.	
Nicholson, William,	Allegheny, 1313 Boyle St.,	Ontario.
Pfarr, A. W.,	Pittsburgh, 202 Cedar St.,	Ontario.
Phillips, J. R.,	Library.	
Rectenwald, Nicholas,	Pittsburgh, 11 Arlington Ave.	
Richards, H. S.,	Pittsburgh, 6328 Penn Ave.,	Ontario.
Spicer, Charles A.,	Coraopolis,	Ontario.
Ware, James T.,	Pittsburgh, 31st & Penn Ave.,	U. P.
Waugh, James A.,	Pittsburgh, 1046 5th Ave.,	Ontario.
Wight, Allen C.,	237 McKee Place, Pittsburgh,	Ohio.
Wight, Willard E.,	Pittsburgh, 237 McKee Place,	Ontario.

ARMSTRONG COUNTY

Booker, S. F.,	Kittanning.	
Gorman, David A.,	Kittanning.	
Huber, Charles H.,	Rural Valley.	
Montgomery, Anthony,	Elderton.	
Schall, Henry B.,	Kittanning, R. F. D. 3.	

BEAVER COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Barclay, Francis J.,	Industry, R. F. D. 1,	"Castrator."
Fouse, Clyde E.,	Ambridge,	U. P.
Greenlee, C. W.,	Beaver Falls, 716 11th St.,	Ohio.
Laberge, Charles Z.,	Beaver Falls,	Montreal.
Perdue, W. M.,	Beaver Falls,	Ont. & McKillip.
Wilke, Theodore E.,	Beaver Falls,	Kansas City.

BEDFORD COUNTY

Bassler, Daniel F.,	Woodbury.	
Breidenthal, William H.,	Loysburg.	
Detwiler, George D.,	Woodbury, R. F. D. 2.	
Manges, Abram B.,	Schellsburg, R. F. D. 1.	
Robison, Ephraim,	Steckman.	
Robison, Reynolds,	Piney Creek.	

BERKS COUNTY

Baver, Alvin F.,	Stony Run,	Chicago.
Berger, R. L.,	Shartlesville,	Grand Rapids.
Bieber, U. S. G.,	Kutztown,	American.
Brossman, Charles W.,	Womelsdorf,	Ontario.
Cleaver, Kilburn H.,	Reading,	Ontario.
Collins, Charles O.,	West Leesport,	Ontario.
Deck, William,	Bethel.	
Deeds, Owen P.,	Shillington.	
DeTurck, Daniel H.,	Birdsboro,	Chicago.
DeTurk, Martin D.,	Oley,	Chicago.
Dreibeibis, Perry K.,	Virginville, R. F. D. 1,	Ontario.
Dunkelberger, John W.,	Bernville,	Ontario.
Fetherolf, George R.,	Reading,	Ontario.
Gross, William D.,	Reading,	Ontario.
Gruber, Charles D.,	Bernville,	Ontario.
Hossler, Fred. B.,	Hamburg, R. F. D. 1.	
Huyett, Walter G.,	Wernersville,	Ontario & McKillip.
Kohler, Daniel R.,	Boyertown,	Ontario.
Landis, Tobias E.,	New Berlinville.	
LeVan, David B.,	Kutztown,	Chicago.
Lutz, Nathaniel F.,	Tulpehocken.	
Miller, Franklin W.,	Sinking Spring, R. F. D. 2.	
Miller, John P.,	Reading,	U. P.
Miller, Pierce M.,	Sinking Spring, R. F. D. 2.	
Noack, Otto G.,	Reading,	Berlin.
Petersheim, Samuel M.,	Morgantown.	
Roberts, Owen B.,	Blandon.	
Schaeffer, James D.,	Fleetwood.	
Schaeffer, Nicholas L.,	Fleetwood,	Chicago.
Schmoyer, Albert H.,	Boyertown,	Chicago.
Sebastian, George B.,	Rehrersburg.	
Seitzinger, William H.,	Wernersville.	
Werley, Kirby D.,	Hamburg,	McKillip.

BLAIR COUNTY

Bennett, John,	Tyrone.	
Bryan, Milton M.,	Altoona.	
Bush, Irving M.,	Altoona,	Chicago.
Dilling, Conrad B.,	Lakemont, Box No. 3, Star Route.	
Dilling, Jacob L.,	Clover Creek.	
Ford, Simon,	East Freedom.	
Gelbert, Chas. S.,	1303 7th Ave., Altoona,	U. P.
Hileman, W. S.,	Williamsburg,	U. P.
Kipe, Joseph, Sr.,	Williamsburg, R. F. D. 1.	
Newcomer, Christian,	Henrietta.	
Richards, John,	Eldorado.	
Schwartz, Geo. A.,	Flat Iron Building, Altoona,	U. P.
Sell, John,	Hollidaysburg, R. F. D. 3.	

BRADFORD COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Allis, Ned H.,	Wyalusing,	Ontario.
Crawford, Eli M.,	Athens,	Ontario.
Cummings, James D.,	Monroeton.	
Davies, Montague A.,	Troy,	Ontario.
Gay, Jode S.,	Wyalusing.	
Haverly, Alexander C.,	Overton.	
Marshall, Leslie G.,	Towanda,	U. P.
Mayer, F. B.,	Canton,	McKillip.
Taylor, Robert E.,	Windham,	U. P.
Van Cise, George B.,	Athens, R. F. D. 26.	

BUCKS COUNTY

Appel, William W.,	Passer,	N. Y. College.
Baum, Howard L.,	Shelly,	Ontario.
Berg, Adolf	Doylestown,	Berlin.
Bostock, Charles B.,	New Britain,	Royal.
Collom, William B.,	Doylestown,	N. Y. College.
Foster, Jesse D.,	Newtown,	U. S. College.
Gruver, Elias A.,	Quakertown,	N. Y. College.
Haines, W. Albertson,	Bristol,	U. P.
Massinger, Wesley,	Chalfont,	N. Y. College.
Morris, Franklin S.,	Revere,	N. Y. American.
Moyer, Enos M.,	Perkasie,	N. Y. College.
Moyer, H. Clayton,	Blooming Glen,	U. P.
Moyer, Vincent C.,	Southampton,	U. P.
Moyer, C. W.,	Quakertown,	U. P.
Nicholas, William S.,	Bedminster,	Columbia.
Patterson, James,	Bristol.	
Price, Samuel G.,	Doylestown.	
Ridge, William H.,	Trevose,	U. P.
Riley, Garrie W.,	New Hope,	U. P.
Rosenberger, J. N.,	Wycombe,	U. P.
Schleicher, Frank L.,	Riegelsville.	
Slaughter, William T.,	Bristol.	
Swartz, Levi B.,	Wismer.	
Terry, Harry C.,	Langhorne,	American.
Turner, Henry W.,	New Hope.	U. P.
Wasser, Charles,	Durham.	
Willard, Samuel B.,	Yardley,	U. P.

BUTLER COUNTY

Britton, E. Grant,	Butler,	Ontario.
Frazier, John,	Butler.	
Milroy, Andrew L.,	Evans City,	Ontario.
Service, Don C.,	Butler,	Grand Rapids.
Smith, William F.,	Renfrew, R. F. D. 29.	
Snow, William C.,	Petrolia, R. F. D. 73.	

CAMBRIA COUNTY

Anderson, Alexander R.,	Johnstown,	U. S. College.
Koontz, Royal B.,	Johnstown,	U. P.
Prothero, William B.,	Johnstown,	N. Y. College.
Riggel, Joseph J.,	Loretto.	
Stull, D. D.,	Johnstown, R. F. D. 2.	

CARBON COUNTY

Balliet, Harvey J.,	Bowmanstown,	Ontario.
Blank, Henry L.,	Lehighton.	
Corkill, Joseph J.,	Mauch Chunk,	Grand Rapids.
Snyder, Owen W.,	Lehighton,	Ontario.
Swank, George K.,	East Mauch Chunk,	U. P.

CENTRE COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Barker, Frank P.,	Coburn.	
Bitner, Samuel A.,	Spring Mills, R. F. D. 3.	
Bowersox, Jno. F. D.,	Aaronsburg.	
Bowersox, D. F.,	Aaronsburg.	
Fiedler, Michael P.,	Millheim,	U. P.
Frank, Philip C.,	Spring Mills, R. F. D. 4.	
Fry, William H.,	Pine Grove Mills.	
Kaup, George S.,	Boalsburg.	
Miller, Harvey H.,	Rebersburg.	
Nissley, S. M.,	Bellefonte,	U. P.
Reish, Samuel,	Pleasant Gap.	

CHESTER COUNTY

Bartholomew, Jonathan C.	Berwyn,	U. P.
Conard, Milton E.,	West Grove,	U. P.
Custis, Howard H.,	Malvern,	U. P.
Diemer, Ardemus,	Spring City.	
Daub, Samuel E.,	Spring City.	
Downs, Morris M.,	Lionville,	N. Y. College.
Eshleman, John M.,	Parkesburg,	U. P.
Evans, Mordecai L.,	Phoenixville.	
Falls, Francis,	Phoenixville,	U. P.
Gatchell, Enoch M.,	West Chester.	
Haenn, Joseph E.,	Malvern,	U. P.
Hickman, David E.,	West Chester,	U. P.
Kafroth, George B.,	Honeybrook.	
Loller, Jesse G.,	Kennett Square, R. F. D. 3.	
Mancill, D. D.,	Downingtown,	U. P.
Massinger, Eber M.,	Phoenixville,	N. Y. College.
Mathues, S. W.,	West Chester, 433 W. Miner St.,	N. Y. College.
Mertz, Peter J.,	Honeybrook,	Ontario.
Oat, Charles F.,	West Chester,	U. P.
Price, Benjamin,	West Chester,	U. P.
Quarll, Joseph T.,	Avondale,	U. P.
Ralston, Lewis,	Phoenixville.	
Rushworth, Edward,	Malvern.	
Stubbs, E. L.,	Oxford,	U. P.
Thompson, William C.,	Berwyn.	
Windle, Waverly A.,	Kennett Square,	U. P.
Young, George J.,	Coatesville,	Ontario.
Young, S. Taylor,	Oxford,	U. P.

CLARION COUNTY

Bell, Boyd,	Turnip Hole.	
Black, Alvin F.,	Alum Rock, R. F. D. 1.	
Collner, Levi,	St. Petersburg.	
Detar, Clem M.,	Fryburg,	Ontario.
Elder, Noringtgon H.,	Alum Rock, R. F. D. 1.	
Emery, Harry,	Clarion,	Ohio.
Exley, John H.,	Knox, R. F. D. 3.	
Fox, Philip M.,	Sligo, R. F. D. 3.	
Kahle, Thomas M.,	Shippensville, R. F. D.	
Schuey, Geo. B.,	East Brady,	Ontario.
Shively, Wm. G.,	Lamartine,	Ontario.
Smith, Jeremiah,	Lawsonham, R. F. D. 1.	
Wenner, George,	Knox, R. F. D. 1.	
Whitiing, William H.,	Knox.	

CLINTON COUNTY

Allen, William,	Mill Hall, R. F. D. 2.	
Good, Charles R.,	Lock Haven,	Ontario.
Ruhl, John S.,	Tylersville.	
Ruhl, Jonathan,	Tylersville.	

CLEARFIELD COUNTY

NAME	ADDRESS	GRADUATION COLLEGE OF
Burkett, Simon T.,	Falls Creek.	
Griest, Franklin W.,	Osceola Mills.	
Hamilton, Frank A.,	DuBois,	Ohio.
Lantz, George K.,	Sabula,	U. S. College.
Winner, Harry S.,	Clearfield,	U. P.

COLUMBIA COUNTY

Baker, Eli A.,	Espy,	Ontario.
Mather; John W.,	Berwick,	Ontario.
Sallade, J. G.,	Benton,	Ontario.
Sands, Harry G.,	Benton,	Ontario.
Smith, Wm. J.,	Stillwater.	
Welliver, George H.,	Bloomsburg,	Ontario.

CRAWFORD COUNTY

Ash, Wesley,	Meadville,	Castrator.
Green, Elebbens,	Cambridge Springs.	
Hendrick, M. P.,	Meadville, 999 S. Park Ave.,	Ont. & McKillip.
McLean, C. C.,	Meadville,	Ontario.
McMillen, Sylvester S.,	Spring borough, R. F. D. 36.	
McMullen, Hugh H.,	Linesville.	
Norton, Elwin S.,	Meadville, Box 233,	U. P.
Pease, W. W.,	Meadville,	Chicago.
Prather, John V.,	Titusville,	American.
Reid, Walter,	Shadeland.	
Sloan, Lewis D.,	Conneautville.	
Wilson, William M.,	Hartstown,	Ontario.

CUMBERLAND COUNTY

Ashmore, C. D.,	Newville,	U. S. College.
Bigelow, F. C.,	Carlisle,	U. P.
Kann, Ralph L.,	Mechanicsburg,	Ont. & McKillip.
May, Alfred R.,	Boiling Springs.	
Morette, E. M. C.,	Carlisle,	U. S. College.
Moyer, William H.,	Mechanicsburg,	Ontario.
Salmon, Henry,	Shippensburg.	
Simmons, Jacob W.,	Mechanicsburg, R. F. D. 6.	
Staley, Raymon M.,	Camp Hill,	U. P.
Witmer, Hervey W.,	Shippensburg,	Ontario.

DAUPHIN COUNTY

Brehm, Samuel E.,	Hummelstown.	
Brown, Phares,	Penbrook.	
Collins, Horace H.,	Elizabethville,	Ontario.
Deckard, Israel K.,	Middletown,	American.
Fox, William W.,	Hummelstown,	U. P.
Gimper, William S.,	Harrisburg,	U. P.
Gise, John B.,	Gratz.	
Haas, James A.,	Harrisburg,	American.
Harpel, David S.,	Penbrook.	
Hughes, William,	Harrisburg,	U. P.

DAUPHIN COUNTY—Continued.

NAME	ADDRESS	COLLEGE OF GRADUATION
Lyter, Emanuel W.,	Berrysburg.	
McKissick, William G.,	Millersburg.	
Munce, T. Edward,	Harrisburg,	U. P.
Oyler, John H.,	Harrisburg,	Ontario.
Schreffler, Aaron,	Berrysburg.	
Shaffer, William H.,	Progress.	
Zellers, Isaac W.,	Harrisburg.	

DELAWARE COUNTY

Davison, Richard Y.,	Morton,	U. P.
DeHaven, Frank R.,	Wayne.	
Deubler, E. C.,	Media,	U. P.
Dohan, Charles A.,	Darling,	U. P.
Fallows, George T.,	Chester.	
Green, Louis K.,	Boothwyn,	U. P.
Horner, J. C.,	Broomail,	U. P.
Johnston, Walter S.,	Moore,	N. Y. College.
Leighton, Harry F.,	Union Stock Yards, Pittsburgh,	U. P.
Lienhardt, Richard P.,	Wayne,	U. P.
Lintz, Charles,	Chester,	U. P.
Mattson, William H.,	Chester Heights,	U. P.
McGroarty, Wm. B.,	Boothwyn,	U. P.
Quinn, T. J.,	Darby,	U. P.
Record, Edward,	Glenolden,	U. P.
Reichel, John,	Glenolden,	U. P.
Rhoads, Warren L.,	Lansdowne,	American.
Underhill, Benjamin M.,	Media,	U. P.
Webster, Richard G.,	Chester,	U. P.
Werntz, William T. S.,	Media,	U. P.
White, W. G.,	Lansdowne,	U. P.
Woodward, Frank J.,	Media,	U. P.

ELK COUNTY

Kaul, William,	St. Marys,	Ontario.

ERIE COUNTY

Bryce, John,	Erie,	Ontario.
Coover, Eugene McL.,	Erie,	Chicago.
Doutt, James L.,	Union City, R. F. D. 4.	
Elviage, James C.,	Erie,	Ontario.
Greenfield, George W.,	Corry,	U. P.
Irons, Joel B.,	Erie,	Ontario.
Jervis, Frank C.,	Edinboro,	Ontario.
Mitchell, Adrian J.,	Erie,	Ontario.
Mitchell, Adrian J., Jr.,	Erie,	Chicago.
Myers, George A.,	Albion, R. F. D. 1.	
Nick, Charles W.,	Erie.	
Phillips, John R.,	North East.	
Purington, B. M.,	Corry.	
Rice, Horace,	Union City.	
Sill, Joseph E.,	Union City, R. F. D. 5.	
Spencer, A. H.,	Girard,	U. P.
Whitaker, Charles J.,	Girard.	
Wilkins, Charles,	Union City, R. F. D. 3.	

FAYETTE COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Gregg, Ira M.,	S. Brownsville.	
Lutz, Charles V.,	Perryopolis,	Ont. & McKillip.
Magee, George,	Uniontown.	
Sherrick, Franklin N.,	Connellsville,	Ontario.
Springer, Charles W.,	Uniontown,	U. P.
Waldron, Thomas M.,	Uniontown,	Ontario.

FRANKLIN COUNTY

Beattie, B. M.,	Chambersburg,	U. P.
Bradley, John L.,	Mercersburg,	American.
Brindle, David C.,	Chambersburg,	Ontario.
Deardorff, Jacob W.,	Mont Alto, R. F. D. 1.	
Hoover, John W.,	Chambersburg, R. F. D. 3.	
Horst, Samuel L.,	Chambersburg, R. F. D. 3.	
Keepers, Robert W.,	Greencastle,	Kansas City.
Kuhn, John M.,	Mercersburg,	Ontario.
Lesher, John L.,	Chambersburg, R. F. D. 2.	
McKibbin, Robert W.,	Waynesboro,	Ontario.
Moore, Joseph W.,	Waynesboro.	
Ryder, Daniel,	Chambersburg,	Ontario.
Saylor, Joseph,	Fayetteville.	
Shiffert, John,	Chambersburg.	
Shiffert, John C. Jr.,	Chambersburg,	N. Y. College.
Shook, Warren B.,	Greencastle,	U. P.
Stover, John P.,	Greencastle,	Ontario.
Strickler, Charles M.,	Greencastle,	Ontario.
Strickler, J. E.,	Chambersburg, R. F. D. 2,	U. S. College.
Wadel, Samuel,	Shippensburg, R. F. D. 4.	

GREENE COUNTY

Hench, Charles M.,	Waynesburg,	**U. P.**
Mackey, Daniel M.,	Cameron.	
McClure, Floyd L.,	Dunkard,	Geo. Washington.
McClure, Fred K.,	Dunkard,	Geo. Washington.
Wise, J. Houston,	Time.	

HUNTINGDON COUNTY

Baumgardner, J. C.,	Cottage.	
Curry, Basil G.,	E. Huntingdon,	Ontario.

INDIANA COUNTY

Barr, George A.,	Marion Centre, R. F. D. 3.	
Elkin, Albert F.,	Smicksburg, R. F. D. 1,	Grand Rapids & McKillip.
Elkin, Joseph H.,	Indiana,	Grand Rapids.
Kime, John T.,	Cherry Tree.	
McCurdy, C. L.,	Creekside,	Grand Rapids.
McMillen, William,	Home, R. F. D. 1.	
St. Clair, James H.,	Blairsville.	
Thomas, Wilson C.,	Marion Centre.	
Timblin, Ward N.,	Indiana,	Chicago.
Weamer, Silas C.,	Indiana.	

JEFFERSON COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Bethune, J. G.,	Punxsutawney,	Cincinnati.
Hoffman, F. F.,	Brookville,	Ontario.
Pifer, William J.,	Punxsutawney, R. F. D. 3.	
Rentschler, M. D.,	Punxsutawney,	McKillip.
Rockey, Wm. A.,	Punxsutawney,	Chicago.
Temple, S. W.,	Allen Mills.	

JUNIATA COUNTY

Ebright, Norman,	Mifflintown,	Ontario.
Sieber, Cyrus,	Mifflintown.	

LACKAWANNA COUNTY

Allen, David V.,	Moscow.	
Helmer, Henry,	Scranton.	
Helmer, Jacob,	Scranton,	American.
James, Thomas D.,	Scranton,	U. P.
Leutholt, Henry,	Taylor,	Chicago.
Lynett, J. F.,	Scranton,	U. P.
Moyer, Samuel C.,	Carbondale,	Ontario.
Osborne, Russell	Peckville,	N. Y. College.
Paget, Harry A.,	Scranton,	Ontario.
Parker, Walter G.,	Clark's Summit, R. F. D. 1,	U. P.
Sitterly, Charles M.,	Scranton.	
Sitterly, John R.,	Scranton,	Ontario.
Widmer, E. W.,	Scranton, 529 Adams Ave.	

LANCASTER COUNTY

Barnard, Harry W.,	Lancaster,	U. P.
Bausman, Abraham B.,	Millersville.	
Bear, Harry H.,	Mount Joy,	American.
Becker, Henry N.,	Elizabethtown, R. F. D. 3.	
Becker, Stehman S.,	Manheim,	Chicago.
Bender, Harry E.,	Lititz,	U. P.
Bender, Wiedler K.,	Lititz.	
Brackbill, John C.,	Soudersburg.	
Brady, Howard B.,	Lancaster,	Ontario.
Breneman, Henry F.,	Mount Joy, R. F. D. 4.	
Brubaker, Edwin S.,	Ephrata, R. F. D. 2.	
Bryson, John B.,	Ephrata.	
Buckwalter, Dorous,	Lancaster, R. F. D. 6.	
Chodes, B. P.,	Gap,	U. P.
Clark, William B.,	Strasburg.	
Cline, William,	Lancaster.	
Cornman, Ernest L.,	Marietta,	U. P.
Erb, Daniel B.,	East Petersburg.	
Gilliland, S. H.,	Marietta.	U. P.
Graybill. Guy M.,	East Petersburg,	U. P.
Gross, Reuben C.,	Elizabethtown,	N. Y. College.
Hamme, John H.,	Lancaster.	
Herr, John,	Manheim, R. F. D. 4.	
Johnson, Joseph,	Union Stock Yards, Lancaster,	U. P.
Kendig, Alfred.	Safe Harbor, R. F. D. 1.	
Leber, Jacob G.,	Ephrata.	
Longenecker, Abraham,	Manheim.	
Longenecker. William,	Lititz,	Ontario.
Martin, David G.,	Lancaster.	
Metzgar, Abram H.,	Millersville,	U. P.
Minich, Benjamin F.,	Columbia,	American.
Newcomer, Ezra W.,	Mount Joy,	U. P.
Olweiler, Jacob F.,	Elizabethtown,	McKillip.
Paxson, William H.,	Marietta,	U. P.

LANCASTER COUNTY—Continued

NAME	ADDRESS	COLLEGE OF GRADUATION
Piersol, Warren R.,	New Holland,	U. P.
Royer, M. B.,	Leola,	U. P.
Strayer, W. M.,	Lancaster.	
Uibel, Charles B.,	Terre Hill,	Columbian.
Webb, William T.,	Quarryville,	U. P.
Weber, Samuel E.,	Lancaster,	Ontario.
Wehr, Grant A.,	Denver,	Ontario & McKillip.
Weli, John B.,	Terre Hill.	
Will, Samuel,	Bainbridge, R. F. D. 1.	
Will, Horace T.,	Elizabethtown, R. F. D. 1.	
Witmer, John M.,	Lancaster.	

LAWRENCE COUNTY

Bittles, Edmund E.,	New Castle,	Ontario.
Nugent, Thomas F.,	New Castle,	Ontario.
Porter, Edmund C.,	New Castle,	Ontario.
Taylor, Frederick,	Pulaski,	U. P.

LEBANON COUNTY

Becker, Jacob N.,	Palmyra.	
Betz, Jacob W.,	Palmyra, R. F. D. 1.	
Collins, Milton J.,	Myerstown.	
Feather, Jacob,	Lebanon.	
Fernsler, Frank U.,	Lebanon,	U. P.
Koller, Obadiah L.,	Myerstown.	
Noll, Lawrence G.,	Annville, R. F. D. 2.	
Phillips, George S.,	Newmanstown.	
Shugar, Harry B.,	Lebanon,	American.
Speck, A. Harvey,	Fredericksburg.	
Stover, John F.,	Fredericksburg.	
Yingst, Henry,	Annville, R. F. D. 2.	

LEHIGH COUNTY

Blank, Gillmor G.,	Allentown,	Ontario.
Fenstermacher, J. O.,	New Tripoli,	McKillip.
Foelker, John C.,	Allentown.	
Foelker, Samuel J.,	Allentown,	Ontario.
Haas, Solomon,	Schnecksville, R. F. D. 1.	
Harper, Milton D.,	Breinigsville,	N. Y. College.
Heckenberger, Henry,	Catasauqua,	Ontario.
Hillegass, Jesse Z.,	Allentown,	Ontario.
Keck, Morris W.,	Slatington,	Ontario.
Kramlich, Richard L.,	Fogelsville,	Ontario.
Kruger, Wilhelm,	Zionsville.	
Kuehner, Mellis E.,	Allentown,	U. P.
Moyer, Henry B.,	Alburtis, R. F. D. 2.	
Schantz, A. L.,	Allentown, R. F. D. 1.	
Shoemaker, Lucas E.,	East Texas.	
Stein, Howard L.,	Emaus,	Ontario.
Weaver, Victor B.,	Coopersburg.	
Werley, C. Daniel,	Jordan,	Ohio.
Wieand, Edwin,	Macungie.	
Wieand, Victor H.,	Allentown.	
Yoder, E. C.,	Allentown,	Ontario.

LUZERNE COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Arnold, William,	Wapwallopen, R. F. D. 1.	
Church, Harry R.,	Wilkes-Barre,	Ontario.
Davis, Fred E.,	Nanticoke,	U. P.
DuBois, George B.,	Wilkes-Barre,	Ontario.
Easen, Thomas,	Wilkes-Barre,	U. P.
Farley, Harry M.,	Hazleton,	U. P.
Foos, Arthur C.,	Hazleton,	Ontario.
Grigger, John,	Plymouth.	
Hogg, Edwin,	Wilkes-Barre,	U. P.
Lutes, Emory,	Wilkes-Barre,	McKillip.
McNeal, Frank J.,	Wilkes-Barre,	Ontario.
Monroe, Franklin,	Plymouth.	
Phipps, William P.,	Wilkes-Barre,	U. P.
Stoker, Hilbert S.,	Wilkes-Barre,	U. P.
Sutton, Bruce S.,	Wilkes-Barre.	
Terry, Addison J.,	Pittston,	Ontario.
Timberman, J. H.,	Wilkes-Barre.	
Walter, Charles R.,	Hazleton,	U. P.
Welsh, Samuel G.,	Drifton,	U. P.
Wiltraut, Frank A.,	Wilkes-Barre,	Ontario.

LYCOMING COUNTY

Biehl, Walter G.,	Loyalsock,	American.
Biles, Charles R.,	Jersey Shore,	U. P.
Gordner, Daniel R.,	Hughesville.	
Keller, David M.,	Williamsport,	Ontario.
Smith, G. F.,	Hughesville,	U. P.
Stickles, Samuel,	English Centre.	
Super, Daniel H.,	Warrensville,	Ontario.
Sweely, Elmer E.,	Williamsport,	Ontario.
Tallman, Bertram H.,	Williamsport,	U. P.
Tomlinson, William J.,	Williamsport,	American.
Yeagie, Joseph C.,	Warrensville.	
Zurkow, M. L.,	Jersey Shore,	U. P.

McKEAN COUNTY

Cory, Ara O.,	Coryville.	
Dick, George A.,	Kane,	U. P.
Gallup, Charles C.,	Smethport.	
Griffith, John J.,	Bradford,	U. P.

MERCER COUNTY

Cole, G. P.,	Grove City,	Ontario.
Freed, Byron M.,	Sharon,	Ontario.
Phelan, Richard M.,	Sharon,	Ontario.
Royer, David R.,	Jamestown,	Ontario.
Snyder, Joseph G.,	Jackson Centre, R. F. D. 17.	
Snyder, S. David,	Mercer, R. F. D. 1.	
Urey, H. M.,	Fredonia.	
Wier, Arthur W.,	Greenville,	Ohio.

MIFFLIN COUNTY

Holman, Abram L.,	Lewistown,	McKillip.
Ulsh, Henry M.,	Lewistown, R. F. D. 2.	

MONROE COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Boorem, John,	Mountain Home.	
Gregory, John E.,	Stroudsburg,	U. P.
Kiethline, John T.,	East Stroudsburg,	Ontario.

MONTOUR COUNTY

Foust, David,	Strawberry Ridge, R. F. D. 1.	
Kline, John J.,	Danville,	Ontario.
Moore, John M.,	Danville, R. F. D. 3.	
Reed, J. Orville,	Danville,	Ontario.

MONTGOMERY COUNTY

Baum, Abraham L.,	Pennsburg,	Ontario.
Beck, Wm.,	Royersford.	
Bickel, Daniel G.,	Green Lane, R. F. D. 1.	
Borneman, Harris S.,	Norristown,	Ontario.
Carter, Barclay F.,	Norristown,	U. P.
Cassel, Eli,	Norristown.	
Davidheiser, Allen K.,	Pottstown,	N. Y. College.
Davis, Evan R.,	Hatboro.	
Davis, R. Lewis,	Hatboro.	
Dengler, Harry O.,	Norristown,	Ontario.
Detwiler, David C.,	Iron Bridge,	Ontario.
Gilbert, Elwood G.,	Pottstown,	American.
Harkins, M. J.,	Conshohocken,	U. P.
Keeler, Jesse H.,	Kulpsville.	
Keelor, Allen Z.,	Telford,	Ontario.
Keelor, J. Rein,	Harleysville,	Ontario.
Keely, Horace P.,	Schwenksville,	U. P.
Kuhns, William H.,	Ardmore.	
Larzelere, Samuel D.,	Jenkintown,	U. P.
Morgan, Warren B.,	Norristown,	U. P.
Nester, Jacob B.,	Frederick.	
Powell, Edgar W.,	Bryn Mawr,	U. P.
Price, Samuel H.,	Collegeville.	
Reifsnyder, I. S.,	Collegeville,	U. P.
Richards, John L.,	Pottstown, 65 Hanover St.	
Rile, Edward A.,	Blue Bell,	U. P.
Ritter, Albert B.,	Pennsburg,	Ontario.
Rivers, Reuben,	Lansdale,	U. P.
Seidel, Edward,	Bryn Mawr,	U. P.
Snyder, Noah S.,	Colmar.	
Van Buskirk, G. T.,	Willow Grove,	U. P.
Wilson, W. Howard,	Roslyn,	N. Y. College.

NORTHAMPTON COUNTY

Bachman, Leidy J.,	South Bethlehem,	American.
Coble, Ira G.,	Bath.	
Groner, Lewis R.,	Bath,	Ontario.
Keim, Samuel C.,	Bethlehem.	
Koehler, Edward F.,	Easton,	American.
Koehler, Theodore J.,	Easton.	
Mock, William,	Easton,	Ontario.
Moyer, Theodore W.,	Siegfried,	American.
Palmer, Clinton B.,	Easton,	Chicago.
Radley, Aaron W.,	Bethlehem,	American.
Reinert, Daniel E.,	Nazareth,	U. P.
Ruch, H. E.,	Portland,	U. P.
Stover, Mahlon G.,	Nazareth,	Ontario.
Waidner, Charles J.,	Hellertown,	N. Y. College.

NORTHUMBERLAND COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Althouse, Edward P.,	Sunbury,	U. P.
Bitler, Sherman E.,	Turbutville,	Ontario.
Bolich, Harry P.,	Mt. Carmel,	U. P.
Fry, Hugh L.,	Milton,	U. P.
Kauffman, Harvey F.,	Shamokin,	Ontario.
McNeal, Harry T.,	Sunbury,	Ontario.
McNeal, Peter,	Shamokin,	Ontario.
Mitterling, Ira,	Sunbury,	U. P.
Moyer, J. W.,	Sunbury, R. F. D. 3.	
Weikel, Lemuel,	Watsontown.	

PERRY COUNTY

Buchanon, John W.,	Liverpool, R. F. D. 2.	
Harris, David B.,	Cisna Run.	
Jones, William H.,	Millerstown.	
Meiser, William A.,	Newport,	Ontario & McKillip.
Miller, Charles H.,	Duncannon,	U. P.
Tyler, Thomas B.,	Marysville.	

PHILADELPHIA COUNTY

Adams, John W.,	Philadelphia, 39th & Woodland Ave.,	U. P.
Andress, Wm. Russell,	Philadelphia, 4922 Clarissa St.,	U. P.
Barnes, Miller F.,	Philadelphia, 39th & Wodland Ave.,	U. P.
Behrens, Edw. E.,	Philadelphia, 2121 N. 27th St.,	U. P.
Bickley, John S.,	Philadelphia, 1703 Green St.	
Birch, W. A.,	Philadelphia, 1124 N. 4th St.,	N. Y. College.
Booth, E. T.,	Philadelphia, 221 S. 36th St.,	U. P.
Bower, Henry,	Philadelphia, 2306 W. Huntington St.,	U. P.
Boylan, John L.,	Philadelphia, 763 N. 43rd St.,	U. P.
Bredt, Martin,	Philadelphia, 1626 S. 4th St.,	U. P.
Bridge, Charles E.,	Philadelphia, 228 N. 53rd St.,	American.
Bridge, Francis,	Philadelphia, 228 N. 53rd St.,	
Burd, Harvey W.,	Philadelphia, 1515 Thompson St.,	U. P.
Burke, H. I.,	Philadelphia, 805 Vine St.,	Chicago.
Campbell, H. C.,	Philadelphia, 39th & Woodland Ave.,	U. P.
Carlisle, Thomas S.,	Philadelphia, 8413 Shawnee St., Chestnut Hill.	U. P.
Castor, Thomas,	Philadelphia, 4914 Frankford Ave.,	U. P.
Coleman, David H.,	Philadelphia, 8938 Frankford Ave., Torresdale.	Ontario.
Cooke, H. T. B.,	Philadelphia, 1249 N. 28th St.	
Cooke, William A., Jr.,	Philadelphia, 1249 N. 28th St.,	U. P.
Cox, Harry B.,	Philadelphia, 1516 Snyder Ave.,	American.
Davis, L. Blake,	Philadelphia, 827 E. Girard Ave.,	U. P.
Denton, W. James,	Philadelphia, 1812½ Market St.	
DeSwan, George W.,	Philadelphia, 120 Rector St., Manayunk.	
Devlin, R. A.,	Philadelphia, 2034 Wallace St.,	U. P.
Dingley, E. C.,	Philadelphia, 5335 Delancey St.,	U. P.
Drake, Mayhar W.,	Philadelphia, 1315 Wharton St.,	American.
Drummond. Gilbert G.,	Philadelphia, 2734 N. 11th St.,	U. P.
Eckman, Thomas T.,	Philadelphia, Sixth & Market Sts.	
Edwards, Warren T.,	Philadelphia, 5610 Pemberton St.,	U. P.
Feist, A. A.,	Philadelphia, Veterinary Hospital, U. of P.,	U. P.
Felton, Howard B.,	Philadelphia, 5424 Second St., Pike, Olney,	U. P.
Ferley, John T.. Jr.,	Philadelphia, 1728 S. 15th St.,	American.
Fitzpatrick, Dennis B.,	Philadelphia, 3214 Woodland Ave.,	U. P.
Fuller, George S.,	Philadelphia, 1715 N. 12th St.,	N. Y. College.
Gerety, J. P.,	Philadelphia, 3433 Lancaster Ave.,	U. P.
Gladfelter, Robert,	Philadelphia, 1230 N. 18th St.	
Glass, Alexander,	Philadelphia, 2321 Spruce St..	Montreal.
Goldhaft, Arthur D.,	Philadelphia, 527 Pine St.,	U. P.
Graham, James,	Philadelphia, 115 Queen Lane, Germantown,	Royal.
Graham, John J.,	Philadelphia, 115 Queen St., Gtn.,	U. P.
Guilfoyle, Calvert T.,	Philadelphia, 1526 N. Gratz St.,	U. P.
Guilfoyle, Harold N.,	Philadelphia, 1526 N. Gratz St.,	U. S. College.
Gwinner, Chas. W.,	Philadelphia, 39th & Woodland Ave.,	U. P.
Hackler, H. D.,	Philadelphia, 2068 E. Fletcher St.,	Ontario.
Haigh, H. H.,	Philadelphia, 3438 N. Broad St.,	U. P.
Haley, Peter,	Philadelphia, 3733 Market St.,	"Dentist."
Haley, Peter J. Jr.,	**Philadelphia, 3733 Market St.,**	**U. P.**
Hartman, Guldin R.,	**Philadelphia, 934 Diamond St.,**	**U. P.**

PHILADELPHIA COUNTY—Continued

NAME	ADDRESS	COLLEGE OF GRADUATION
Hendren, Oliver T.,	Philadelphia, 6645 Ridge Ave., Roxborough,	U. P.
Herbott, Julius W.,	Philadelphia, 1217 N. 8th St.,	U. P.
Hoedt, W. H.,	Philadelphia, Wisshickon,	U. P.
Hoskins, Cheston M.,	Philadelphia, 3452 Ludlow St.,	U. P.
Hoskins, W. Horace,	Philadelphia, 3452 Ludlow St.,	American.
Houldsworth, Joseph D.,	Philadelphia, Manayunk,	U. P.
Ivens, W. H.,	Philadelphia, 5328 Haverford Ave.,	U. P.
Jarrett, Henry T.,	Philadelphia, 311 S. 13th St.,	U. P.
Johnston, Samuel H.,	Philadelphia, 2235 Franklin St., North,	N. Y. College.
Kellner, Edward L.,	Philadelphia, Germantown, Phila. Bourse,	U. P.
Kelly, Thomas,	Philadelphia, 1204 Pine St.,	U. P.
Kimball, Victor G.,	Philadelphia, 39th St. & Woodland Ave.,	N. Y. College.
Klein, Louis A.,	Philadelphia, 39th & Woodland Ave.,	U. P.
Lee, Wm. J.,	Philadelphia, 3613 Haverford Ave.,	U. P.
Lentz, Frank E.,	Philadelphia, U. of P., 3715 Woodland Ave.,	U. P.
Lentz, William J.,	Philadelphia, 39th St. & Woodland Ave.,	U. P.
Linberg, J. Wm.,	Philadelphia, 1723 N. 55th St.,	U. P.
McFayden, John,	Philadelphia, 5215 Reinhart St.	
Maher, John J.,	Philadelphia, 1336 Marshall St.,	U. P.
Mansbach, Louis A.,	Philadelphia, 1515 N. Franklin St.	
Marlin, Edgar,	Philadelphia, 329 E. Lehigh Ave., Kensington.	U. P.
Marshall, Clarence J.,	Philadelphia, 5031 Pine St.,	U. P.
Martien, Henry D.,	Philadelphia, 735 N. 43d St.,	U. P.
McAnulty, James T.,	Philadelphia, 1445 S. Eighth St.	
McAnulty, John F.,	Philadelphia, 2832 N. Sixth St.,	U. P.
McCloskey, Anthony J.,	Philadelphia, Chestnut Hill,	U. P.
McCloskey, James A.,	Philadelphia, 39th St. & Woodland Ave.,	U. P.
McDonough, J. F.,	Philadelphia, 3061 Richmond. St,,	U. P.
McGugan, James,	Philadelphia, 1626 Park Ave.	
McKibbin, D., Jr.,	Philadelphia, 2900 Frankford Ave.,	U. P.
Michener, Hiram M.,	Philadelphia, 3722 N. Broad St.,	U. P.
Miller, Daniel S.,	Philadelhia, 1017 S. 47th St.,	U. P.
Muir, E. Stanton,	Philadelphia, 2145 N. Second St.,	U. P.
Murphy, Patrick F.,	Philadelphia, 1607 N. Fourth St.	
Neff, William H. C.,	Philadelphia, 2211 N. Second St.,	N. Y. College.
Newton, Charles,	Philadelphia, 1220 Locust St.,	U. P.
Nice, Frank K.,	Philadelphia, 3514 N. 15th St., Tioga,	American.
Nice, William H.,	Philadelphia, 6212 Baynton St., Germantown.	American.
Nicholson, Samuel J.,	Phialdelphia, 3159 Belgrade St.,	U. P.
Olding, Frank R.,	Philadelphia, 2315 E. Susquehanna Ave.,	U. P.
Ormiston, Adam W.,	Philadelphia, 102 Herman St., Germantown,	American.
Parker, E. A.,	Philadelphia, 1940 S. 13th St.,	U. P.
Phillips, Isaac B.,	Philadelphia, 5631 Market St.	
Ross, James T.,	Philadelphia, 4818 Frankford Ave., Frankford.	
Roxberry, George W.,	Philadelphia, 3618 N. 16th St., Tioga.	
Saxe, D. M.,	Philadelphia, 925 Carpenter St.,	U. P.
Schaufler, Charles A.,	Philadelphia, 1338 Hunting Park Ave.,	Royal.
Schneider, Frederick H.,	Philadelphia, Old York Road & Erie Ave.,	Columbian.
Schreiber, Albert F.,	Philadelphia, 62nd St. & Elmwood Ave.,	U. P.
Seitter, Joseph B.,	Philadelphia, 1817 E. Tioga St.,	U. P.
Senseman, Benjamin F.,	Philadelphia, 1723 N. 55th St.,	U. P.
Shoemaker, Henry C.,	Philadelphia, 1718 Wallace St.,	N. Y. College.
Smith, Albert N.,	Philadelphia, 1926 Camac St.,	U. P.
Sommer, H. L.,	Philadelphia, 518 N. 5th St.,	U. P.
Spitz, Arthur,	Philadelphia, 3216 Columbia Ave.,	U. P.
Standen, Frank,	Philadelphia, 1220 Locust St.	
Stauffer, Willis B.,	Philadelphia, 1300 N. 28th St.,	U. P.
Stehle, Fred, Jr.,	Philadelphia, 4270 Ridge Ave., Manayunk,	U. P.
Stevens, Elwood B.,	Philadelphia, 301 Earlham Terrace, Gtn.	
Storm, William J.,	Philadelphia, 753 Bourse Bldg.,	U. P.
Terry, Edward E.,	Philadelphia, 2830 Welsh Rd., Holmesburg,	U. P.
Tintsman, John Z.,	Philadelphia, 335 E. Girard Ave.,	U. P.
Vansant, Joseph W.,	Philadelphia, 500 Rhawn St., Fox Chase,	U. P.
Vasey, J. Price,	Philadelphia, 23 School Lane.	
Wagner, F. A.,	Philadelphia, 1429 N. Felton St.,	U. P.
Walls, John J.,	Philadelphia, 820 Dauphin St.	
Weinberg, Herman H.,	Philadelphia, 2250 N. 21st St.,	U. P.
Werntz, Harvey G.,	Philadelphia, 3734 Locust St.,	U. P.
Williams, Charles,	Philadelphia, 1321 Thompson St.,	U. P.
Winstanley, John H.,	Philadelphia, 3400 Spruce St.,	U. P.
Yunker, Elkan H.,	Philadelphia, 2344 N. 18th St.,	U. P.

POTTER COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Quigley, R. M.,	Coudersport,	U. P.
Woodward, James A.,	Shinglehouse,	Ontario.

SCHUYLKILL COUNTY

Curley, E. M.,	Pottsville,	U. P.
Driesbach, Lewis,	Schuylkill Haven.	
Fessler, R. H.,	Pine Grove,	U. P.
Fridirici, Ulysses G.,	Tamaqua,	Ontario.
Heiser, Edward,	Pottsville.	
Klein, Fred S.,	Shenandoah,	U. P.
Kuder, Eugene E.,	Mahanoy City.	
Longacre, Edwin D.,	Shenandoah,	Ontario.
Longacre, William S.,	Sittler,	Ontario.
Lynagh, William,	Pottsville.	
McCarthy, Frank H.,	Pottsville,	Ontario.
Newhard, Irwin C.,	Ashland,	N. Y. College.
Sallade, James W.,	Auburn,	Ontario.
Schwindt, Ambrose E.,	Silver Creek.	
Schaeffer, John H.,	Pine Grove, R. F. D. 2.	

SNYDER COUNTY

Bilger, Enos,	Middleburg.	
Bilger, W. David,	Middleburg, R. F. D. 3.	
Hummel, William A.,	Globe Mills.	
Potteiger, Albert B.,	Selinsgrove,	Ontario.
Rook, Willard G.,	Selinsgrove.	

SOMERSET COUNTY

Ankeney, C. A.,	Harnedsville.	
Beachy, Rufus M.,	Meyersdale.	
Critchfield, Norman B.,	Stoyestown.	
Friedline, Jacob P.,	Somerset, R. F. D. 4,	"Castrator."
Fritz, Simon P.,	Pine Hill,	"Castrator."
Fuller, Willis D.,	Somerset,	U. P.
Gorman, R. A.,	Berlin,	Chicago.
Jacobs, Casper,	Bakersville.	
King, Green B.,	Scullton.	
King, Ross R.,	Rockwood, R. F. D. 2.	
McKinley, Stephen R.,	Elk Lick.	
Weller, John O.,	Meyersdale.	
Wilson, Samuel,	Somerfield.	

SULLIVAN COUNTY

Haverly, William D.,	Campbellsville.	
Osler, Horace N.,	Dushore,	Ontario.

SUSQUEHANNA COUNTY

Barrett, Edson A.,	Susquehanna.	
Barnes, H. W.,	Thompson, R. F. D. 1,	U. P.
Brodhead, Charles W.,	Montrose.	
Cole, A. B.,	Montrose, R. F. D. 2,	Ontario.
Hill, Isaac C.,	Susquehanna, R. F. D. 5.	
Miller, F. B.,	Brooklyn,	Ontario.
Tower, Elmer E.,	Hallstead,	Columbian.

TIOGA COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Bowen, William J.,	Wellsboro, R. F. D. 9.	
Davis, Elisha J.,	Little Marsh.	
Mitchell, Harry B.,	Wellsboro,	U. P.
Reynolds, Roy,	Elkland,	Grand Rapids.
Simpson, Ernest L.,	Knoxville,	N. Y. College.
Stone, Chas. E.,	Westfield,	Grand Rapids.
Strang, Frank,	Westfield.	
Turner, John H.,	Wellsboro,	U. P.
Washburn, Silas S.,	Wellsboro.	
Whiting, Isaac N.,	Mansfield.	
Wilcox, Parris,	Covington.	

UNION COUNTY

Cawley, Amos O.,	Lewisburg,	American.
Cawley, Wililam W.,	Lewisburg.	
Gramley, Joseph A.,	Mifflinburg.	
Grove, Philip H.,	Lewisburg, R. F. D. 1.	
Linderman, P. C.,	Mifflinburg,	U. P.
Sypher, Henry J.,	Allenwood, R. F. D. 1.	

VENANGO COUNTY

Bagnall, Charles,	Franklin,	Chicago.
Bagnall, William P.,	Oil City,	Chicago.
Jobson, George B., Sr.,	Franklin.	
Korbb, Adam F.,	Venus.	
McGinnis, Wm.,	Emlenton, R. F. D. 65.	

WARREN COUNTY

Bonner, James O.,	Garland.	
Chrisman, Merton J.,	Warren,	Ontario.
Wallace, Samuel J.,	Warren,	Ontario.
Wheeler, Joseph J.,	Sugar Grove, R. F. D. 4.	

WASHINGTON COUNTY

Bane, M. A.,	Fredericktown.	
Cahill, Edw. A.,	Canonsburg,	U. P.
Harris, Albert E.,	Speers, R. F. D. 1.	
Hastings, Stephen B.,	West Finley.	
Herron, Moore B.,	Venetia,	U. P.
Frazee, David L.,	Washington, R. F. D. 4.	
McKenna, Charles S.,	Washington,	Chicago.
Palmer, Daniel W.,	Canonsburg, R. F. D. 5.	
Pettibon, David F.,	Burgettstown.	
Rogers, H. G.,	Washington.	
Ullery, A. J.,	Scenery Hill, R. F. D. 3.	
Ullery, W. H.,	Washington.	
Waugh, David,	West Finley, R. F. D. 2,	Indiana.
Waugh, William J.,	Washington,	Ontario.

WAYNE COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Butler, Horace L.,	Ariel.	
Cade, George L.,	Galilee,	Chicago.
Lidstone, Vance R.,	Honesdale,	U. P.

WESTMORELAND CCOUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Albright, John C.,	Greensburg.	
Ames, Arthamer, Jr.,	Saltsburg, R. F. D. 4.	
Bruner, Samuel E.,	Greensburg,	U. P.
Faivre, A. L.,	Latrobe.	
Fulmer, Solomon,	Smithton.	
Lenhart, Matthias P.,	Irwin.	
Lossie, Fred H.,	Monessen,	Chicago.
McBreen, Philip L.,	New Kensington,	Grand Rapids.
Patrick, Murray E.,	Greensburg,	U. P.
Smith, O. P.,	Greensburg, R. F. D. 4.	
Smith, Clement V.,	West Newton, R. F. D. 1.	
Waldron, R. M.,	Greensburg,	Ontario.
Whiteman, Harry J.,	Latrobe,	U. P.
Wright, Harry S.,	Latrobe.	

WYOMING COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Bennett, Norval C.,	Laceyville, R. F. D. 36.	
Meade, Louis E.,	Tunkhannock,	Columbian.
Reynolds, Howard C.,	Factoryville,	Ohio.
Stark, Marcus W.,	Tunkhannock,	Chicago.
Stark, Theron R.,	Mill City.	

YORK COUNTY

NAME	ADDRESS	COLLEGE OF GRADUATION
Bausticker, Edward S.,	York.	
Beecher, William H.,	Brodbecks, R. F. D. 2.	
Bushong, G. L.,	Dover,	U. P.
Craumer, Wesley E.,	Hanover.	
Gladfelter, Michael H.,	Jacobus.	
Gregory, Charles W.,	York.	
Hartenstein, F. H.,	New Freedom,	U. P.
Herbert, William L.,	York,	U. P.
Kain, Franklin M.,	York,	American.
Kain, Charles A.,	York.	
Kline, Harry E.,	York.	
Lehman, Pius A.,	York.	
Lenhart, Charles,	York,	Columbia.
Mumma, Richard T.,	Hanover,	Columbian.
Neuhaus, Chas. O.,	Glen Rock,	U. P.
Seitz, Elmer E.,	Glen Rock,	Columbian.
Sheffer, John A.,	Bair.	
Shue, F. F.,	Hellam, R. F. D. No. 1,	U. P.
Smith, John D.,	Dallastown.	
Spangler, William H.,	Lewisberry.	
Stambaugh, John,	Spring Grove, R. F. D. 3.	
Stambaugh, Nathan,	Hanover.	
Sterner, Conrad D.,	Codorous.	
Wiley, Andrew M.,	Delta, R. F. D. 4.	
Winter, Emanuel A.,	York.	

Commonwealth of Pennsylvania

BULLETIN No. 228

FARMERS'
Institutes in Pennsylvania

TO BE HELD UNDER THE
AUSPICES OF

The Pennsylvania Department of Agriculture

COMPILED BY

A. L. MARTIN, Director of Institutes

SEASON 1912-1913

HARRISBURG:
C. E. AUGHINBAUGH, PRINTER TO THE STATE OF PENNSYLVANIA
1912.

Commonwealth of Pennsylvania

BULLETIN No. 228

FARMERS' INSTITUTES IN PENNSYLVANIA

TO BE HELD UNDER THE AUSPICES OF THE
DEPARTMENT OF AGRICULTURE OF THE
STATE OF PENNSYLVANIA DURING
THE SEASON OF 1912-13

ACT OF THE LEGISLATURE OF MARCH 13, 1895.

"Section 5. That it shall be the duty of the Superintendent of Institutes to arrange them in such manner as to time and places of holding the same as to secure the greatest economy and efficiency of service, and to this end he shall, in each county where such institutes are to be held, confer and advise with the local member of the State Board of Agriculture, together with representatives duly appointed by each county agricultural, horticultural and other like organizations with reference to the appointment of speakers and other local arrangements."

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LETTER OF TRANSMITTAL

DEPARTMENT OF AGRICULTURE

Harrisburg, Pa., *Aug. 1, 1912.*

Hon. N. B. Critchfield, *Secretary of Agriculture:*

Dear Sir: In accordance with the provisions of the Act creating the Department of Agriculture, I have the honor to present herewith the schedule of Farmers' Institutes of Pennsylvania for the season of 1912-1913; also a complete list of lecturers, with their subjects and their assignments.

Very respectfully,

A. L. MARTIN,
Director of Institutes.

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF AGRICULTURE

DIVISION OF INSTITUTES

Harrisburg, Pa., *Aug. 1, 1912.*

To the County Chairmen and Boards of Institute Managers in the
Several Counties of Pennsylvania:

Gentlemen: In presenting this annual Bulletin, we desire to express approval of the work accomplished by most of our County Institute Managers and the committees organized by them, to whom much credit is due for the high degree of success attending the last season's Institutes. We respectfully invite your careful attention to "Directions" on the following pages, which are prepared with reference to the requirements and demands of persons filling the position of County Chairman of Institutes.

INSTITUTE MANAGERS AND PROGRAM COMMITTEES WILL PLEASE READ THE FOLLOWING DIRECTIONS BEFORE ARRANGING PROGRAMS AND CAREFULLY COMPLY WITH SAME IN CONDUCTING INSTITUTES

1. We recommend that programs for all the Institutes held within a county be printed on connected leaves or sheets. This practice is recommended because of economy in cost of printing, also the wider advertising of the different institutes held within the county.

2. Prepare program at least thirty days before the date of Institute.

3. Arrangements should be made with persons in your locality who are to take part on the program either by essay, address or reading, at least eight weeks previous to the meeting.

4. Have a Question Box, and place it in charge of some competent person who will carefully conduct the same.

5. Exclude from Institutes all sectarian and partisan topics.

6. Print on program the name and postoffice address of Chairman and members of Committees.

7. Thoroughly advertise the Institute by distributing programs, invitation postal cards, posters, and make use of your local newspapers.

8. Select a competent secretary to take notes and report proceedings of meeting to local papers.

9. Invite representatives of newspapers to a place at Recording Secretary's table, and solicit their aid and assistance in reporting proceedings of meeting.

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10. For a two-day Institute, provide for five sessions, taking up not more than two topics at any one session, and where local speakers have places on program, the committee should be careful and see to it that their subjects shall conform to the topics under consideration at that particular session.

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11. Locate Institutes where a suitable hall or church can be procured and the greatest number accommodated, as these meetings are for the benefit of farmers and their families and all others who may be interested.

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12. Extend a personal invitation to your County Superintendent of Public Schools to be present and take part, especially at the educational session, without which no Institute is complete. Invite all farm organizations, school teachers and children. See to it that young men and boys have a special invitation to the Institute.

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13. At least three State speakers will be in attendance, and a list of topics which they are prepared to discuss can be found in another part of this Bulletin. From this list the Committee on Program should select such topics as would most interest the farmers in their section, and place same opposite the lecturer's name on program.

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14. The County Chairman should, as soon as arrangements are completed for holding Innstitute, enclose to all lecturers expected to be present, a copy of program, with letter designating what railroad station to stop at, and the name of the hotel secured for their accommodation. In case Institute is held at a distance from railroad, speakers must be met by conveyances and taken to Institute. The expense of getting from and to such stations is paid from funds placed in hands of County Chairman.

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15. Remember, the Institute is for the whole county and not merely for the town or locality where held. Begin advertising and do not fail to let the public know of your meeting.

16. The State is divided into five sections. Beginning November 29, five institutes will be in session at the same time. Three State speakers will be present at all Institutes, one of whom will be a special representative of the Department and have charge of the section, to whom shall be referred all questions relating to local management of institutes. His decision in such matters shall be final.

17. It is important that the Chairman of County Board of Institute Managers make a complete report and mail same to the Director as soon as possible after the close of the Institutes. Blanks for this purpose will be forwarded him.

18. Attention of Institute Managers and Program Committees is especially called to the plan of assigning speakers in the various sections. The leader of the section will be found at head of tabulated list of Places, and Additional Lecturers will be found at right of places where institutes will be held. Do no make the mistake as some Committees have done and overlook the leader of the section, but place his name on the program in like manner as other speakers are assigned.

19. The County Chairman should take personal charge of the meeting or select a person who is well qualified to fill the position.

20. The opening exercises should be brief, not consuming more than 30 minutes, and may consist of an address of welcome and response, or a brief address by the Chairman introducing the speakers who come from a distance.

21. Two topics thoroughly discussed at one session affords the opportunity for more effective instruction than three or four only partially presented.

22. At Educational Session, confine all discussions to that important subject, whether the speakers be State or local.

23. Where two evening sessions are held, have one devoted to Educational subjects and the other to the interests of the Country Home, its Comforts, Sanitary Conditions and Adornments.

24. Music, properly conducted, is in place at the Institute, but should be introduced as a recreation and be voluntary as no fund is set apart for this purpose.

25. The amount of money to be distributed to the various managers for local expenses, will be according to the number of days of institutes held. In order to make the amount ample for the coming season, the sum has been fixed at $12.50 per day of institute. This provides $25.00 for each two days of institute, to be used for local expenses, such as printing programs, rent of halls, necessary expenses of local managers, etc. County Chairmen are reimbursed for all reasonable expenses up to $12.50 per day, but no per diem pay is recognized.

DIRECTIONS FOR CONSTITUTING LOCAL COMMITTEES ON INSTITUTE WORK IN THE SEVERAL COUNTIES OF PENNSYLVANIA

The act of March 13, 1895 (Section 5), makes the following provisions: "That it shall be the duty of the Superintendent of Institutes to arrange them in such manner as to time and places of holding the same, as to secure the greatest economy and efficiency of service, and to this end he shall, in each county where such institutes are to be held, confer and advise with the local member of the State Board of Agriculture, together with the representatives duly appointed by each county agricultural, horticultural or other like organizations, with reference to the appointment of speakers and other local arrangements."

In order to carry this provision of the law into effect, the director of Institutes directs that these representatives, one from each county organization as stated, duly chosen and properly accredited, together with the County Chairman of Institutes, shall constitute a Board of County Institute Managers, of which the County Chairman of Institutes shall be the Chairman of the said Board. The organizations entitled to representation, are members of the State Board of Agriculture, County Agricultural and Horticultural Societies, Pomona Granges and County Alliances.

The duty of this Board shall be to confer and advise with each other and the Director of Institutes, with reference to the appointment of speakers and other local arrangements for holding institutes.

It shall be the duty of each county organization named to notify the Director of Institutes of the appointment of its representatives, and at the same time give a similar notice to the County Chairman of Institutes.

The County Chairman of Institutes, together with these representatives of the county organizations, shall meet for organization on the second Tuesday in June in each year, at one o'clock P. M., in the county town, at the office of the county commissioners. At this meeting the place for holding institutes for the ensuing season shall be selected, the same to be subject to the approval of the Director of Institutes. An institute committee will also be appointed at this time, for each locality in which institutes are to be held.

The County Chairman of Institutes, and each duly accredited representative of the county organizations in attendance upon this meeting shall, upon the certificate of the Chairman of the Board of Managers, be paid his expenses, not to exceed two dollars.

In these meetings every member shall have equal voice, and the action of the majority shall decide. Notice of the action of the Board shall be sent by the Chairman to the Director of Institutes, within ten days after the meeting.

In case no representative from any county organization of that county shall appear at the meeting on the second Tuesday of June, as stated, then the County Chairman of Institutes shall immediately report the fact to the Director of Institutes and proceed to arrange for the holding of institutes that year,, without further consultation with the local organizations.

All moneys allotted to any county, for use in institute work, will be paid to the chairman of the local committee, to be accounted for by him in an itemized statement, audited and signed by auditors appointed by the committee, and then forwarded to this Department, not later than the first day of May in each year.

APPORTIONMENT FOR 1912-1913

Section 1		Section 2		Section 3		Section 4		Section 5	
COUNTY	Days	COUNTY	Days	COUNTY	Days	COUNTY	Days	COUNTY	Days
Adams,	6	Bedford,	4	Allegheny,	6	Bradford,	8	Berks,	8
Chester,	8	Blair,	6	Armstrong,	6	Clarion,	6	Bucks,	8
Cumberland,	6	Cambria,	6	Butler,	6	Clinton,	6	Carbon,	4
Dauphin,	6	Centre,	6	Beaver,	6	Cameron,	4	Columbia,	7
Delaware,	4	Clearfield,	6	Crawford,	8	Elk,	4	Lehigh,	6
Franklin,	6	Fulton,	4	Fayette,	6	Erie,	6	Luzerne,	6
Lancaster,	14	Huntingdon,	6	Greene,	4	Forest,	4	Lackawanna,	6
Lebanon,	6	Juniata,	4	Indiana,	10	Jefferson,	4	Monroe,	5
Perry,	4	Mifflin,	4	Lawrence,	10	Lycoming,	6	Northampton,	6
Philadelphia,	2	Montour,	4	Mercer,	6	McKean,	4	Pike,	4
York,	10	Northumberland,	6	Venango,	4	Potter.	5	Schuylkill,	6
		Snyder,	4	Washington,	6	Sullivan,	2	Wayne,	7
		Somerset,	6	Westmoreland,	10	Tioga,	10	Montgomery,	8
		Union,	4			Warren,	6	Susquehanna,	6
						Wyoming,	4		
	72		70		88		79		87

COMPLETE LIST OF

PENNSYLVANIA FARMERS' INSTITUTES,

SEASON OF 1912-1913

GIVING THE COUNTIES IN ALPHABETICAL ORDER, AND THE NAME AND ADDRESS OF THE CHAIRMAN OF EACH COUNTY; ALSO POST-OFFICE AND RAILROAD STATION OF PLACE WHERE INSTITUTES ARE HELD

DIVISION OF INSTITUTES

County	Place	Post Office	Railroad Station	Date	Chairmen of Institutes
Adams,	New Oxford,	New Oxford,	New Oxford,	Jan. 1-2,	A. I. Weidner, Arendtsville.
	Gettysburg,	Gettysburg,	Gettysburg,	Jan. 3-4,	
	Biglerville,	Biglerville,	Biglerville,	Jan. 6-7,	
Allegheny,	Millertown,	Tarentum,	Tarentum,	Feb. 17-18,	A. J. Purdy, Imperial, R. D. No. 1.
	New Texas,	Unity,	Unity Station,	Feb. 19-20,	
	Imperial,	Imperial,	Imperial,	Feb. 21-22,	
Armstrong,	Worthington,	Worthington,	Craigville, R. D.,	March 3-4,	S. S. Blyholder, Kelly Station.
	Kittanning,	Kittanning,	Kittanning,	March 5-6,	
	Leechburg,	Leechburg,	Leechburg,	March 7-8,	
Beaver,	New Bethlehem,	New Sheffield,	South Height,	Dec. 16-17,	A. L. McKibben, New Sheffield.
	Darlington,	Darlington,	Darlington,	Dec. 18-19,	
	Beaver,	Beaver,	Beaver,	Dec. 20-21,	
Bedford,	Mench,	Everett, R. D. No. 6	Everett,	Jan. 15-16,	W. F. Biddle, Everett, R. D. No. 2.
	Woodbury,	Woodbury,	Woodbury,	Jan. 17-18,	
Berks,	Strausstown,	Strausstown,	Shoemakersville,	Feb. 21-22,	Howard G. McGowan, Geigers Mills.
	Topton,	Topton,	Topton,	Feb. 24-25,	
	Jacksonwald,	Jacksonwald,		Feb. 26-27,	
	Geigertown,	Geigers Mills,	Geigertown,	Feb. 28-March 1,	
Blair,	Newry,	Newry,	McKees,	Feb. 24-25,	W. Frank Beck, No. 1927 W. Chestnut Ave., Altoona.
	Geesytown,	Hollidaysburg, R. D.	Hollidaysburg,	Feb. 26-27,	
	Tyrone,	Tyrone,	Tyrone,	Feb. 28-March 1,	
Bradford,	Wilmont,		Wyalusing,	Jan. 29-30,	F. D. Kerrick, Towanda, R. D. No. 9.
	Lime Hill,	Camptown,	Ferry,	Jan. 31-Feb. 1,	
	Leraysville,	Leraysville,	Wysox,	Feb. 3-4,	
	Wysox,	Wysox,	Wysox,	Feb. 5-6,	

DIVISION OF INSTITUTES—Continued.

County	Place	Post Office	Railroad Station	Date	Chairmen of Institutes
Bucks,	Richlandtown,	Richlandtown,	Quakertown,	Feb. 14–15,	B. F. Wambold, Sellersville.
	Blooming Glen,	Blooming Glen,	Sellersville,	Feb. 17–18,	
	Pineville,	Pineville,	Wycombe,	Feb. 19–20,	
	Newtown,	Newtown,	Newtown,	Feb. 21–22,	
Butler,	Jackville,	Slippery Rock,	Portersville,	Feb. 10–11,	W. H. Milliron, Euclid.
	West Sunbury,	West Sunbury,	Euclid,	Feb. 12–13,	
	Eureka Grange,	Butler,	Butler,	Feb. 14–15,	
Cambria,	Wilmore,	Wilmore,	Wilmore,	Dec. 2–3,	James Westrick, Patton, R. D. No. 2.
	Chest Springs,	Chest Springs,	Ashville,	Dec. 4–5,	
	Cross Roads Grange Hall.	Hastings,	Hastings,	Dec. 6–7,	
Cameron,	Rich Valley,	Rich Valley,	Rich Valley,	Dec. 27,	F. X. Blumle, Emporium.
	Howards,	Howards,	Howards,	Dec. 28,	
	Sizerville,	Sizerville,	Sizerville,	Dec. 30,	
	Driftwood,	Driftwood,	Driftwood,	Dec. 31,	
Carbon,	Weatherly,	Weatherly,	Weatherly,	Feb. 3,	Edw. Lienhard, Mauch Chunk.
	Big Creek,	Weissport,	Weissport,	Feb. 4,	
	New Mahoning,	Lehighton,	Lehighton,	Feb. 5–6,	
Centre,	Philipsburg,	Philipsburg,	Philipsburg,	March 10–11,	J. A. Woodward, Howard.
	Port Matilda,	Port Matilda,	Port Matilda,	March 12–13,	
	Spring Mills,	Spring Mills,	Rising Spring,	March 14–15,	
Chester,	West Chester,	West Chester,	West Chester,	Dec. 5–6,	M. E. Conard, Westgrove.
	Oxford,	Oxford,	Oxford,	March 3–4,	
	Unionville.	Unionville,	Unionville,	March 5–6,	
	Avondale,	Avondale,	Avondale,	March 7–8,	
	Cedarville,	Pottstown,	Pottstown,	March 10–11,	
Clarion,	Miola,	Miola,	Clarion,	Dec. 16–17,	J. H. Wilson, Clarion.
	Blairs Corners,	Blairs Corners,	Blairs,	Dec. 18–19,	
	Limestone,	Limestone,	Limestone,	Dec. 20–21,	

Clearfield,	Mahaffey,	Mahaffey,	Mahaffey,	March 3-4,	Peter Gearhart, Clearfield.
	Grampian,	Grampian,	Grampian,	March 5-6,	
	Blue Ball,	West Decatur,	Blue Ball,	March 7-8,	
Clinton,	Woolrich,	Woolrich,	Lock Haven,	Jan. 1-2,	Joel A. Herr, Millhall.
	Salona,	Salona,	Salona,	Jan. 3-4,	
	Beech Creek,	Beech Creek,	Beech Creek,	Jan. 6-7,	
Columbia (Movable Institute Schools.)	Millville,	Millville,	Millville,	Feb. 3-6,	A. P. Young, Millville.
	Lime Ridge,	Lime Ridge,	Lime Ridge,	Feb. 5-8,	
Crawford,	Cambridge Springs,	Cambridge Springs,	Cambridge Springs,	Jan. 6-7,	J. S. Patton, Hartstown.
	Saegerstown,	Saegerstown,	Saegerstown,	Jan. 8-9,	
	Guys Mills,	Guys Mills,	Guys Mills,	Jan. 10-11,	
	Black Ash,	Guys Mills,	Meadville,	Jan. 13-14,	
Cumberland,	Centerville,	Dickinson.	Longsdorf,	Jan. 15-16,	T. J. Ferguson, Mechanicsburg.
	Oakville,	Oakville,	Oakville,	Jan. 17,	
	Hogestown,	Hogestown,	Mechanicsburg,	Jan. 18,	
	Churchtown,	Churchtown,	Churchtown,	Jan. 20-21,	
Dauphin,	Middletown,	Middletown,	Middletown,	March 12-13,	E. S. Keiper, Middletown.
	Linglestown,	Linglestown,	Harrisburg,	March 14-15,	
	Gratz,	Gratz,	Elizabethville,	March 17-18,	
Delaware,	Media,	Media,	Media,	Feb. 26-27,	E. J. Durnall, Swarthmore.
	Concordville,	Concordville,	Concordville,	Feb. 28-March 1,	
Elk,	St. Marys,	St. Marys,	St. Marys,	Nov. 29-30,	John G. Schmidt, St. Marys.
	Weedville,	Weedville,	Weedville,	Dec. 2-3,	
Erie, (Movable Institute School),	Girard,	Girard,	Girard,	March 7-8,	Archie Billings, Edinboro.
	Waterford,	Waterford,	Waterford,	Jan. 31-Feb. 4,	
Fayette,	Fayette City,	Fayette City.	Fayette City,	Nov. 29-30,	T. H. Smith, Dunbar, R. D. No. 32.
	Laurel Hill,	Dunbar, R. D. No. 32.	Vance Hill,	Dec. 2-3,	
	Dawson,	Dawson,	Dawson,	Dec. 4-5,	
Forest,	Clarington,	Clarington,	Brookville,	March 3-4,	C. A. Randall, Tionesta.
	Tionesta,	Tionesta,	Tionesta,	March 5-6,	
Franklin,	Dry Run,	Dry Run,	Richmond,	Jan. 8-9,	J. P. Young, Marion.
	Fayetteville,	Fayetteville,	Fayetteville,	Jan. 10-11,	
	Marion,	Marion,	Marion,	Jan. 13-14,	
Fulton,	McConnellsburg,	McConnellsburg,	Mercersburg,	Nov. 26-27,	J. L. Patterson, McConnellsburg.
	Needmore,	Needmore,	Hancock, Md.,	Nov. 29-30,	

DIVISION OF INSTITUTES—Continued.

County	Place	Post Office	Railroad Station	Date	Chairmen of Institutes
Greene,	Kuhntown,	Pine Bank,	Waynesburg,	Dec. 6-7,	J. W. Stewart, Jefferson.
	Mt. Pleasant Church	Waynesburg,	Waynesburg,	Dec. 9-10,	
Huntingdon,	Trough Creek,	Todd,	Cooks Mills,	Feb. 17-18,	G. G. Hutchison, Warriors Mark.
	Merklesburg,	James Creek,	Merklesburg,	Feb. 19-20,	
	Petersburg,	Petersburg,	Petersburg,	Feb. 21-22,	
Indiana,	Wilgus,	Wilgus,	Arcadia,	Dec. 27-28,	S. C. George, West Lebanon.
	Richmond,	Rochester Mills,	Savan,	Dec. 30-31,	
	Creekside,	Creekside,	Creekside,	Jan. 1-2,	
	West Lebanon,	West Lebanon,	West Lebanon,	Jan. 3-4,	
	Dilltown,	Dilltown,	Dilltown,	Jan. 6-7,	
Jefferson,	Kirkman,	Brookville, R. D.	Brookville,	Dec. 4-5,	Peter B. Cowan, Brookville.
	Stanton,	Brookville, R. D.,	Brookville,	Dec. 5-7,	
Juniata,	Thompsontown,	Thompsontown,	Thompsontown,	Dec. 13-14,	Matthew Rodgers, Mexico.
	East Waterford,	East Waterford,	East Waterford,	Dec. 16-17,	
Lackawanna,	Tompkinsville,	Jermyn, R. D.,	Jermyn,	Jan. 6-7,	Horace Seamans, Factoryville.
	Clarks Summit,	Clarks Summit,	Clarks Summit,	Jan. 8-9,	
	Madisonville,	Madisonville,	Moscow,	Jan. 10-11,	
Lancaster,	Quarryville,	Quarryville,	Quarryville,	Nov. 29-30,	J. Aldus Herr, Lancaster, R. D. No. 4.
	Lampeter,	Lampeter,	Lampeter,	Dec. 2-3,	
	Paradise,	Paradise,	Paradise,	Dec. 4-5,	Edw. Hibshman, Ephrata.
	Mechanicsville,	Manheim,	Manheim,	Dec. 6-7,	
	Lititz,	Lititz,	Lititz,	Dec. 16-17,	
	Ephrata,	Ephrata,	Ephrata,	Dec. 18-19,	
	Maytown,	Maytown,	Maytown,	Dec. 20-21,	
Lawrence,	Pulaski,	Pulaski,	Pulaski,	Feb. 3-4,	Sylvester Shaffer, New Castle, R. D.
	Princeton,	Princeton,	Princeton,	Feb. 5-6,	
	Plaingrove,	Plaingrove,	Brent,	Feb. 7-8,	
(Movable Institute School),	New Wilmington,	New Wilmington,	New Wilmington,	Jan. 29-Feb. 1,	

Lebanon,	Annville,	Annville,	Annville,	Jan. 27–28,	Edward Shuey, Lickdale.
	Schaefferstown,	Schaefferstown,	Richland,	Jan. 29–30,	
	Jonestown,	Jonestown,	Jonestown,	Jan. 31–Feb. 1,	
Lehigh,	New Tripoli,	New Tripoli,	New Tripoli,	Feb. 7–8,	P. S. Fenstermaker, Allentown.
	Laurys,	Laurys,	Laurys,	Feb. 10–11,	
	Alburtis,	Alburtis,	Alburtis,	Feb. 12–13,	
Luzerne,	Dallas,	Dallas,	Dallas,	Jan. 13–14,	J. E. Hildebrant, Dallas.
	Orange,	Pittston, R. D.,	Dallas,	Jan. 15–16,	
	Hobbie,	Wapwallopen,	Wapwallopen,	Jan. 17–18,	
Lycoming,	Pine Run,			Jan. 8–9,	A. J. Kahler, Hughesville.
	Limestone,			Jan. 10–11,	
	Hughesville,	Hughesville,	Hughesville,	Jan. 13–14,	
McKean,	Coryville,	Coryville,	Coryville,	Feb. 25,	O. W. Abbey, Turtle Point.
	Port Allegany,	Port Allegany,	Port Allegany,	Feb. 26–27,	
	Kane,	Kane,	Kane,	March 1,	
Mercer,	Hendersonville,	Sandy Lake,	Sandy Lake,	Jan. 27–28,	Wm. C. Black, Mercer.
	Fredonia,	Fredonia,	Fredonia,	Jan. 29–30,	
	West Middlesex,	West Middlesex,	West Middlesex,	Jan. 31–Feb. 1,	
Mifflin,	Lewistown,	Lewistown,	Lewistown,	Dec. 18–19,	M. M. Naginey, Milroy.
	Belleville,	Belleville,	Belleville,	Dec. 20–21,	
Monroe,	Brodheadsville,	Brodheadsville,	Stroudsburg,	Dec. 18–19,	F. S. Brong, Saylorsburg.
	Sciota,	Sciota,	Stroudsburg,	Dec. 20–21,	
	North Water Gap,	North Water Gap,	Stroudsburg,	Dec. 23,	
Montgomery,	Trappe,	Trappe,	Collegeville,	March 3–4,	J. H. Schultz, No. 506 Hamilton St., Norristown.
	Centre Point,	Worcester,	Norristown,	March 5–6,	
	Salfordsville,	Salfordsville,	Salford,	March 7–8,	
	East Greenville,	East Greenville,	East Greenville,	March 10–11,	
Montour,	White Hall,	White Hall,	Strawberry Ridge,	Feb. 3–4,	J. Miles Derr, Milton, R. D. No. 1.
	Mausdale,	Mausdale,	Mausdale,	Feb. 5–6,	
Northampton,	Mt. Bethel,	Mt. Bethel,	Mt. Bethel,	Jan. 27–28,	C. S. Messinger, Tatamy.
	Nazareth,	Nazareth,	Nazareth,	Jan. 29–30,	
	Cherryville,	Cherryville,	Treichlers,	Jan. 31–Feb. 1,	
Northumberland,	Rebuck,	Rebuck,	Herndon,	Jan. 27–28,	I. A. Eschbach, Milton, R. D. No. 1.
	Pottsgrove,	Pottsgrove,	Pottsgrove,	Jan. 29–30,	
	Watsontown,	Watsontown,	Watsontown,	Jan. 31–Feb. 1,	
Philadelphia,	Bustleton,	Philadelphia,	Bustleton,	Feb. 24–25,	S. K. Foster, Torresdale.

DIVISION OF INSTITUTES—Continued.

County	Place	Post Office	Railroad Station	Date	Chairmen of Institutes
Perry,	Markelsville,	Markelsville,	Newport,	Dec. 27–28,	
	Blain,	Blain,	Blain,	Dec. 30–31,	
Pike,	Greentown,	Greentown,	Gouldsboro,	Dec. 6–7,	B. F. Killam, Paupack.
	Egypt Mills,	Egypt Mills,	Bushkill,	Dec. 16–17,	
Potter,	Genessee,	Genessee,	Genessee,	Feb. 19–20,	A. T. Crittenden, Oswayo.
	Shingle House,	Shingle House,	Shingle House,	Feb. 21–22,	
	Clara,	Roulette, R. D.,	Clara Crossing,	Feb. 24,	
Schuylkill,	McKeansburg,	McKeansburg,	New Ringgold,	Feb. 14–15,	John Shoener, New Ringgold.
	Valley View,	Valley View,	Good Springs,	Feb. 17–18,	
	Friedensburg,	Friedensburg,	Schuylkill Haven,	Feb. 19,	
	Summit Station,	Summit Station,	Summit Station,	Feb. 20,	
Snyder,	Freeburg,	Freeburg,	Selinsgrove,	Feb. 12–13,	F. F. Glass, Freeburg.
	Beavertown,	Beavertown,	Beavertown,	Feb. 14–15,	
Somerset,	Boswell,	Boswell,	Boswell,	Jan. 8–9,	J. C. Weller, Rockwood.
	Somerset,	Somerset,	Somerset,	Jan. 10–11,	
	Berlin,	Berlin,	Berlin,	Jan. 13–14,	
Sullivan,	Estella,	Estella,	Dushore,	Jan. 27–28,	E. R. Warburton, Campbellville.
Susquehanna,	Lawsville,	Lawsville,	Montrose,	Nov. 29,	F. A. Davies, Montrose.
	Montrose,	Montrose,	Montrose,	Nov. 30,	
	Harford,	Harford,	Kingsley,	Dec. 2–3,	
	Clifford,	Clifford,	Clifford,	Dec. 4–5,	
Tioga,	Liberty,	Liberty,	Roaring Branch,	Feb. 7–8,	C. H. De Witt, Mansfield.
	Mansfield,	Mansfield,	Mansfield,	Feb. 10–11,	
	Mitchells Mills,	Millerton,	Trobridge,	Feb. 12–13,	
	Wellsboro,	Wellsboro,	Wellsboro,	Feb. 14–15,	
	Westfield,	Westfield,	Westfield,	Feb. 17–18,	

Union,	Allenwood,	Allenwood,	Allenwood,	Feb. 7–8,	J. Newton Glover, Vicksburg.
	Vicksburg,	Vicksburg,	Vicksburg,	Feb. 10–11,	
Venango,	Dempseytown,	Franklin,	Franklin,	Jan. 15–16,	W. A. Crawford, Cooperstown.
	Rockland,	Rockland,	Rockland,	Jan. 17–18,	
Warren,	Sugargrove,	Sugargrove,	Sugargrove,	Jan. 30–31,	G. A. Woodside, Sugargrove.
	Lottsville,	Lottsville,	Columbus,	Feb. 1–2,	
	Columbus,	Columbus,	Columbus,	Feb. 3–4,	
Washington,	Cross Creek,	Cross Creek,	Burgettstown,	Feb. 24–25,	D. S. Taylor, Burgettstown.
	Hickory,	Hickory,	Hickory,	Feb. 26–27,	
	Centreville,	West Brownsville, R. D.	Centreville,	**Feb. 28–March 1,**	
Wayne,	Honesdale,	Honesdale,	Honesdale,	Dec. 28,	W. E. Perham, Pleasant Mount.
	Aldenville,	Aldenville,	Prompton,	Dec. 30–31,	
	Pleasant Mount,	Pleasant Mount,	Pleasant Mount,	Jan. 1–2,	
	Lakewood,	Lakewood,	Lakewood,	Jan. 3–4,	
Westmoreland,	New Kensington,	New Kensington,	New Kensington,	March 10–11,	M. P. Shoemaker, Greensburg.
	New Alexandria,	New Alexandria,	New Alexandria,	March 12–13,	
	Scottdale,	Scottdale,	Scottdale,	March 14–15,	
(Movable Institute School)	Apollo,	Apollo,	Apollo,	Jan. 27–30,	
Wyoming,	East Lemon,	Tunkhannock, R. D.	Tunkhannock,	Jan. 15–16,	D. A. Knuppenburg, Lake Carey.
	Tunkhannock,	Tunkhannock,	Tunkhannock,	Jan. 17–18,	
York,	Cross Roads,	Cross Roads,	Felton,	Feb. 3–4,	G. F. Barnes, Rossville.
	Loganville,	Loganville,	Gladfelters,	Feb. 5–6,	
	Red Lion,	Red Lion,	Red Lion,	Feb. 7–8,	
	Manchester,	Manchester,	Mt. Wolf,	Feb. 10–11,	
	Wellsville,	Wellsville,	Dillsburg,	Feb. 12–13,	

PENNSYLVANIA FARMERS' INSTITUTES

ASSIGNMENT OF LECTURERS BY SECTIONS FOR 1912-1913

FIRST SECTION

R. P. KESTER will attend all meetings in this section.

Date	Place	County	Additional Lecturers.
Nov. 29-30,	Quarryville,	Lancaster,	F. H. Fassett and W. Theo. Wittman.
Dec. 2-3,	Lampeter,	Lancaster,	F. H. Fassett and W. Theo. Wittman.
Dec. 4-5,	Paradise,	Lancaster,	F. H. Fassett and W. Theo. Wittman.
Dec. 6-7,	Mechanicsville,	Lancaster,	F. H. Fassett and W. Theo. Wittman.
Dec. 16-17,	Lititz,	Lancaster,	F. H. Fassett and E. L. Phillips.
Dec., 18-19,	Ephrata,	Lancaster,	F. H. Fassett and E. L. Phillips.
Dec. 20-21,	Maytown,	Lancaster,	F. H. Fassett and E. L. Phillips.
Dec. 27-28,	Markelsville,	Perry,	Dr. J. H. Funk and T. J. Philips.
Dec. 30-31,	Blain,	Perry,	Dr. J. H. Funk and T. J. Philips.
Jan. 1-2,	New Oxford,	Adams,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 3-4,	Gettysburg,	Adams,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 6-7,	Biglerville,	Adams,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 8-9,	Dry Run,	Franklin,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 10-11,	Fayetteville,	Franklin,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 13-14,	Marion,	Franklin,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 15-16,	Centerville,	Cumberland,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 17,	Oakville,	Cumberland,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 18,	Hogestown,	Cumberland,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 20-21,	Churchtown,	Cumberland,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 27-28,	Annville,	Lebanon,	Sheldon W. Funk, Chas. A. Row and E. K. Hibshman.
Jan. 29-30,	Schaefferstown,	Lebanon,	Sheldon W. Funk, Chas. A. Row and E. K. Hibshman.
Jan. 31, Feb. 1,	Jonestown,	Lebanon,	Sheldon W. Funk, Chas. A. Row and E. K. Hibshman.
Feb. 3-4,	Cross Roads,	York,	Sheldon W. Funk, Chas. A. Row and E. K. Hibshman.
Feb. 5-6,	Loganville,	York,	Sheldon W. Funk, Chas. A. Row and E. K. Hibshman.
Feb. 7-8,	Red Lion,	York,	Sheldon W. Funk, Chas. A. Row and E. K. Hibshman.

Date	Place	County	Additional Lecturers.
Feb. 10-11,	Manchester,	York,	Sheldon W. Funk, Chas. A. Row and E. K. Hibshman.
Feb. 12-13,	Wellsville,	York,	Sheldon W. Funk, Chas. A. Row and E. K. Hibshman.
Feb. 14-15,	Richlandtown,	Bucks,	Sheldon W. Funk and Mrs. Jean Kane Foulke.
Feb. 17-18,	Blooming Glen,	Bucks,	Sheldon W. Funk and Mrs. Jean Kane Foulke.
Feb. 19-20,	Pineville,	Bucks,	Sheldon W. Funk and Mrs. Jean Kane Foulke.
Feb. 21-22,	Newtown,	Bucks,	Sherldon W. Funk and Mrs. Jean Kane Foulke.
Feb. 24-25,	Bustleton,	Philadelphia,	Sheldon W. Funk and C. C. Hulsart.
Feb. 26-27,	Media,	Delaware,	Sheldon W. Funk and C. C. Hulsart.
Feb. 28, Mar. 1,	Concordville,	Delaware,	Sheldon W. Funk and C. C. Hulsart.
March 3-4,	Oxford,	Chester,	Sheldon W. Funk and C. C. Hulsart.
March 5-6,	Unionville,	Chester,	Sheldon W. Funk and C. C. Hulsart.
March 7-8,	Avondale,	Chester,	Sheldon W. Funk and C. C. Hulsart.
March 10-11,	Cedarville,	Chester,	Sheldon W. Funk and C. C. Hulsart.
March 12-13,	Middletown,	Dauphin,	Chas. T. Cornman, H. M. Anderson and E. B. Dorsett.
March 14-15,	Linglestown,	Dauphin,	Chas. T. Cornman, H. M. Anderson and E. B. Dorsett.
March 17-18,	Gratz,	Dauphin,	Chas. T. Cornman, H. M. Anderson and E. B. Dorsett.

SECOND SECTION

J. T. CAMPBELL will attend all meetings in this section.

Nov. 26-27,	McConnellsburg,	Fulton,	Leon Otice Van Noy and M. S. Bond.
Nov. 29-30,	Needmore,	Fulton,	Leon Otice Van Noy and M. S. Bond.
Dec. 2-3,	Wilmore,	Cambria,	Leon Otice Van Noy and Prof. Frank D. Gardner.
Dec. 4-5,	Chest Springs,	Cambria,	Leon Otice Van Noy and Prof. Frank D. Gardner.
Dec. 6-7,	Cross Roads Grange Hall.	Cambria,	Leon Otice Van Noy and Prof. Frank D. Gardner.
Dec. 13-14,	Thompsontown,	Juniata,	Leon Otice Van Noy and H. H. Havner.
Dec. 16-17,	East Waterford,	Juniata,	Leon Otice Van Noy and Robt. S. Seeds.
Dec. 18-19,	Lewistown,	Mifflin,	Leon Otice Van Noy and Robt. S. Seeds.
Dec. 20-21,	Belleville,	Mifflin,	Leon Otice Van Noy and Robt. S. Seeds.
Dec. 27-28,	Wilgus,	Indiana,	Leon Otice Van Noy and Sheldon W. Funk.
Dec. 30-31,	Richmond,	Indiana,	Leon Otice Van Noy and Sheldon W. Funk.
Jan. 1-2,	Creekside,	Indiana,	Leon Otice Van Noy and Sheldon W. Funk.
Jan. 3-4,	West Lebanon,	Indiana,	Leon Otice Van Noy and Sheldon W. Funk.
Jan. 6-7,	Dilltown,	Indiana,	Leon Otice Van Noy and E. B. Dorsett.

Date.		Place.	County	Additional Lecturers.
Jan.	8-9,	Boswell,	Somerset,	Leon Otice Van Noy, E. B. Dorsett and M. N. Clark.
Jan.	10-11,	Somerset;	Somerset,	Leon Otice Van Noy, E. B. Dorsett and M. N. Clark.
Jan.	13-14,	Berlin,	Somerset,	Leon Otice Van Noy and W. R. White.
Jan.	15-16,	Mench,	Bedford,	Leon Otice Van Noy and W. R. White.
Jan.	17-18,	Woodbury,	Bedford,	Leon Otice Van Noy and W. R. White.
Jan.	27-28,	Rebuck,	Northumberland,	Fred W. Card, Mrs. Edith E. Smith and Leon Otice Van Noy.
Jan.	29-30,	Pottsgrove,	Northumberland,	Fred W. Card, Mrs. Edith E. Smith and Leon Otice Van Noy.
Jan. 31,	Feb. 1,	Watsontown,	Northumberland,	Fred W. Card, Mrs. Edith E. Smith and Leon Otice Van Noy.
Feb.	3-4,	White Hall,	Montour,	Fred W. Card, M. H. McCallum and E. S. Fowler.
Feb.	5-6,	Mausdale,	Montour,	Fred W. Card, M. H. McCallum and E. S. Fowler.
Feb.	7-8,	Allenwood,	Union,	Fred W. Card, M. H. McCallum.
Feb.	10-11,	Vicksburg,	Union,	Fred W. Card and M. H. McCallum.
Feb.	12-13,	Freeburg,	Snyder,	Fred W. Card, M. H. McCallum and E. S. Fowler.
Feb.	14-15,	Beavertown,	Snyder,	Fred W. Card, M. H. McCallum and E. S. Fowler.
Feb.	17-18,	Trough Creek,	Huntingdon,	Fred W. Card, M. H. McCallum and E. S. Fowler.
Feb.	19-20,	Merklesburg,	Huntingdon,	Fred W. Card, M. H. McCallum and E. S. Fowler.
Feeb. ,	21-22,	Petersburg,	Huntingdon,	Fred W. Card, M. H. McCallum and E. S. Fowler.
Feb.	24-25,	Newry,	Blair,	Fred W. Card and M. H. McCallum.
Feb.	26-27,	Geesytown,	Blair,	Fred W. Card and M. H. McCallum.
Feb. 28,	Mar. 1,	Tyrone,	Blair,	Fred W. Card and M. H. McCallum.
March	3-4,	Mahaffey,	Clearfield,	Fred W. Card and M. H. McCallum.
March	5-6,	Grampian,	Clearfield,	Fred W. Card and M. H. McCallum.
March	7-8,	Blue Ball,	Clearfield,	Fred W. Card and M. H. McCallum.
March	10-11,	Philipsburg,	Center,	Fred W. Card and M. H. McCallum.
March	12-13,	Port Matilda,	Center,	Fred W. Card and M. H. McCallum.
March	14-15,	Spring Mills,	Center,	Fred W. Card and M. H. McCallum.

THIRD SECTION

PROF. FRANKLIN MENGES will attend all meetings in this section.

Nov.	29-30,	Fayette City,	Fayette,	Prof. T. I. Mairs and J. B. Johnston.
Dec.	2-3,	Laurel Hill,	Fayette,	Prof. T. I. Mairs and J. B. Johnston.
Dec.	4-5,	Dawson,	Fayette,	Prof. T. I. Mairs and J. B. Johnston.

Date.		Place.	County	Additional Lecturers.
Dec.	6-7,	Kuhntown,	Greene,	Prof. T. I. Mairs and J. B. Johnston.
Dec.	9-10,	Mt. Pleasant Church.	Greene,	Prof. T. I. Mairs and J. B. Johnston.
Dec.	16-17,	New Bethlehem,	Beaver,	A. W. Stephens and R. J. Weld.
Dec.	18-19,	Darlington,	Beaver,	A. W. Stephens and R. J. Weld.
Dec.	20,	Beaver,	Beaver,	A. W. Stephens and R. J. Weld.
Dec.	21,	Beaver,	Beaver,	A. W. Stephens, R. J. Weld and Prof. Miligan C. Kilpatrick.
Dec.	30-31,	Sugar Grove,	Warren,	F. H. Fassett and Dr. M. E. Conard.
Jan.	1-2,	Lottsville,	Warren,	F. H. Fassett, Dr. M. E. Conard and E. S. Fowler.
Jan.	3-4,	Columbus,	Warren,	F. H. Fassett, Dr. M. E. Conard and E. S. Fowler.
Jan.	6-7,	Cambridge Spgs.,	Crawford,	F. H. Fassett, Dr. M. E. Conard and E. S. Fowler.
Jan.	8-9,	Saegerstown,	Crawford,	F. H. Fassett, Dr. M. E. Conard and E. S. Fowler.
Jan.	10-11,	Guys Mills,	Crawford,	F. H. Fassett, Dr. M. E. Conard and E. S. Fowler.
Jan.	13-14,	Black Ash,	Crawford,	F. H. Fassett and Dr. M. E. Conard.
Jan.	15-16,	Dempseytown,	Venango,	F. H. Fassett and Dr. M. E. Conard.
Jan.	17-18,	Rockland,	Venango,	F. H. Fassett and Dr. M. E. Conard.
Jan.	27-28,	Hendersonville,	Mercer,	F. H. Fassett, Chas. M. Barnitz and E. S. Fowler.
Jan.	29-30,	Fredonia,	Mercer,	F. H. Fassett, Chas. M. Barnitz and E. S. Fowler.
Jan. 31,	Feb. 1,	West Middlesex,	Mercer,	F. H. Fassett, Chas. M. Barnitz and E. S. Fowler.
Feb.	3-4,	Pulaski,	Lawrence,	F. H. Fassett, Chas. M. Barnitz and Leon Otice Van Noy.
Feb.	5-6,	Princeton,	Lawrence,	F. H. Fassett, Chas. M. Barnitz and Leon Otice Van Noy.
Feb.	7-8,	Plaingrove,	Lawrence,	F. H. Fassett, Chas. M. Barnitz and Leon Otice Van Noy.
Feb.	10-11,	Jackville,	Butler,	F. H. Fassett, Dr. M. E. Conard and Frank Kline.
Feb.	12-13,	West Sunbury,	Butler,	F. H. Fassett, Dr. M. E. Conard and Frank Kline.
Feb.	14-15,	Eureka Grange,	Butler,	F. H. Fassett, Dr. M. E. Conard and Frank Kline.
Feb.	17-18,	Millertown,	Allegheny,	F. H. Fassett, Dr. M. E. Conard and Frank Kline.
Feb.	19-20,	New Texas,	Allegheny,	F. H. Fassett, Dr. M. E. Conard and Frank Kline.
Feb.	21-22,	Imperial,	Allegheny,	F. H. Fassett, Dr. M. E. Conard and Frank Kline.
Feb.	24-25,	Cross Creek,	Washington,	F. H. Fassett. Dr. M. E. Conard and E. S. Fowler.

Date.	Place.	County	Additional Lecturers.
Feb. 26-27,	Hickory,	Washington,	F. H. Fassett, Dr. M. E. Conard and E. S. Fowler.
Feb 28, Mar. 1,	Centreville,	Washington,	F. H. Fassett and Dr. M. E. Conard.
March 3-4,	Worthington,	Armstrong,	Dr. M. E. Conard and F. H. Fassett.
March 5-6,	Kittanning,	Armstrong,	Dr. M. E. Conard and F. H. Fassett.
March 7-8,	Leechburg,	Armstrong,	Dr. M. E. Conard and F. H. Fassett.
March 10-11,	New Kensington,	Westmoreland,	Dr. M. E. Conard and Mrs. Jean Kane Foulke.
March 12-13,	New Alexandria,	Westmoreland,	Dr. M. E. Conard and Mrs. Jean Kane Foulke.
March 14-15,	Scottdale,	Westmoreland,	Dr. M. E. Conard and Mrs. Jean Kane Foulke.

FOURTH SECTION

L. W. LIGHTY will attend all meetings in this section.

Date.	Place.	County	Additional Lecturers.
Nov., 29-30,	St. Marys,	Elk,	E. B. Dorsett, H. P. Davis and J. H. Peachey.
Dec. 2-3,	Weedville,	Elk,	E. B. Dorsett, H. P. Davis and J. H. Peachey.
Dec. 4-5,	Kirkman,	Jefferson,	E. B. Dorsett, H. P. Davis and J. H. Peachey.
Dec. 6-7,	Stanton,	Jefferson,	E. B. Dorsett, L. W. Arny and J. H. Peachy.
Dec. 16-17,	Miola,	Clarion,	Fred W. Card, W. M. C. Drake and E. B. Dorsett.
Dec. 18-19,	Blairs Corners,	Clarion,	Fred W. Card, W. M. C. Drake and E. B. Dorsett.
Dec. 20-21,	Limestone,	Clarion,	Fred W. Card, W. M. C. Drake and E. B. Dorsett.
Dec. 27,	Rich Valley,	Cameron,	Fred W. Card and W. M. Patton.
Dec. 28,	Howards,	Cameron,	Fred W. Card and W. M. Patton.
Dec. 30,	Sizerville,	Cameron,	Fred W. Card and W. M. Patton.
Dec. 31,	Driftwood,	Cameron,	Fred W. Card and W. M. Patton.
Jan. 1-2,	Woolrich,	Clinton,	Fred W. Card and W. M. Patton.
Jan. 3-4,	Salona,	Clinton,	Fred W. Card and W. M. Patton.
Jan. 6-7,	Beech Creek,	Clinton,	Fred W. Card and W. M. Patton.
Jan. 8-9,	Pine Run,	Lycoming,	Fred W. Card and W. M. Patton.
Jan. 10-11,	Limestone,	Lycoming,	Fred W. Card and W. M. Patton.
Jan. 13-14,	Hughesville,	Lycoming,	Fred W. Card, W. M. Patton and E. S. Fowler.
Jan. 15-16,	East Lemon,	Wyoming,	Fred W. Card, W. M. Patton and E. S. Fowler.
Jan. 17-18,	Tunkhannock,	Wyoming,	Fred W. Card, W. M. Patton and E. S. Fowler.
Jan. 27-28,	Estella,	Sullivan,	D. E. Murray, G. C. Given and F. R. Stevens.
Jan. 29-30,	Wilmont,	Bradford,	D. E. Murray, G. C. Given and F. R. Stevens.
Jan. 31, Feb. 1,	Lime Hill,	Bradford,	D. E. Murray, G. C. Given and F. R. Stevens.
Feb. 3-4,	Leraysville,	Bradford,	D. E. Murray, G. C. Given and F. R. Stevens.
Feb. 5-6,	Wysox,	Bradford,	D. E. Murray, G. C. Given and F. R. Stevens.
Feb. 7-8,	Liberty,	Tioga,	D. E. Murray, G. C. Given and E. S. Fowler.

Date.		Place.	County	Additional Lecturers.
Feb.	10-11,	Mansfield,	Tioga,	J. A. Runk, W. Theo. Wittman and E. S. Fowler.
Feb.	12-13,	Mitchells Mills,	Tioga,	J. A. Runk and W. Theo. Wittman.
Feb.	14-15,	Wellsboro,	Tioga,	J. A. Runk and W. Theo. Wittman.
Feb.	17-18,	Westfield,	Tioga,	J. A. Runk and W. Theo. Wittman.
Feb.	19-20,	Genessee,	Potter,	J. A. Runk and W. Theo. Wittman.
Feb.	21-22,	Shingle House,	Potter,	J. A. Runk and W. Theo. Wittman.
Feb.	24,	Clara,	Potter,	J. A. Runk and W. Theo. Wittman.
Feb.	25,	Coryville,	McKean,	J. A. Runk and W. Theo. Wittman.
Feb.	26-27,	Port Allegany,	McKean,	J. A. Runk and E. L. Phillips.
March	1,	Kane,	McKean,	J. A. Runk and E. L. Phillips.
March	3-4,	Clarington,	Forest,	J. A. Runk and E. L. Phillips.
March	5-6,	Tionesta,	Forest,	J. A. Runk and E. L. Phillips.
March	7-8,	Girard,	Erie,	J. A. Runk and E. L. Phillips.

FIFTH SECTION

D. H. WATTS will attend all meetings in this section.

Nov.	29,	Lawsville,	Susquehanna,	M. H. McCallum and Robt. S. Seeds.
Nov.	30,	Montrose,	Susquehanna,	M. H. McCallum and Robt. S. Seeds.
Dec.	2-3,	Harford,	Susquehanna,	M. H. McCallum and Robt. S. Seeds.
Dec.	4-5,	Clifford,	Susquehanna,	M. H. McCallum and Robt. S. Seeds.
Dec.	6-7,	Greentown,	Pike,	M. H. McCallum and Robt. S. Seeds.
Dec.	16-17,	Egypt Mills,	Pike,	M. H. McCallum and Dr. M. E. Conard.
Dec.	18-19,	Brodheadsville,	Monroe,	M. H. McCallum and Dr. M. E. Conard.
Dec.	20-21,	Sciota,	Monroe,	M. H. McCallum and Dr. M. E. Conard.
Dec.	23,	North Water Gap.	Monroe,	M. H. McCallum and Dr. M. E. Conard.
Dec.	28,	Honesdale,	Wayne,	Howard Mitman and Robt. S. Seeds.
Dec.	30-31,	Aldenville,	Wayne,	Howard Mitman and Robt. S. Seeds.
Jan.	1-2,	Pleasant Mt.,	Wayne,	Howard Mitman and Robt. S. Seeds.
Jan.	3-4,	Lakewood,	Wayne,	Howard Mitman and Robt. S. Seeds.
Jan.	6-7,	Tompkinsville,	Lackawanna,	Sheldon W. Funk and H. M. Gooderham.
Jan.	8-9,	Clarks Summit,	Lackawanna,	Sheldon W. Funk and H. M. Gooderham.
Jan.	10-11,	Madisonville,	Lackawanna,	Sheldon W. Funk and H. M. Gooderham.
Jan.	13-14,	Dallas,	Luzerne,	Sheldon W. Funk, C. L. Goodling and Prof. F. R. Stevens.
Jan.	15-16,	Orange,	Luzerne,	Sheldon W. Funk, C. L. Goodling and Prof. F. R. Stevens.
Jan.	17-18,	Hobbie,	Luzerne,	Sheldon W. Funk, C. L. Goodling and Prof. F. R. Stevens.

Date.		Place.	County	Additional Lecturers.
Jan.	27-28,	Mt. Bethel,	Northampton,	W. H. Stout and Dr. W. T. Phillipy.
Jan.	29-30,	Nazareth,	Northampton,	W. H. Stout and Dr. W. T. Phillipy.
Jan. 31,	Feb. 1,	Cherryville,	Northampton,	W. H. Stout and Dr. W. T. Phillipy.
Feb.	3,	Weatherly,	Carbon,	Mrs. Jean Kane Foulke and Ernest L. Anthony.
Feb.	4,	Big Creek,	Carbon,	Mrs. Jean Kane Foulke and Ernest L. Anthony.
Feb.	5-6,	New Mahoning,	Carbon,	Mrs. Jean Kane Foulke and Ernest L. Anthony.
Feb.	7-8,	New Tripoli,	Lehigh,	Mrs. Jean Kane Foulke and Ernest L. Anthony.
Feb.	10-11,	Laurys,	Lehigh,	Mrs. Jean Kane Foulke, Dr. J. H. Funk and Prof. F. R. Stevens
Feb.	12-13,	Alburtis,	Lehigh,	Mrs. Jean Kane Foulke, Dr. J. H. Funk and Prof. F. R. Stevens.
Feb.	14-15,	McKeansburg,	Schuylkill,	Chas. T. Cornman, Dr. J. H. Funk and Prof. F. R. Stevens.
Feb.	17-18,	Valley View,	Schuylkill,	Chas. T. Cornman, Dr. J. H. Funk and Prof. F. R. Stevens.
Feb.	19,	Friedensburg,	Schuylkill,	Chas. T. Cornman, Dr. J. H. Funk and Prof. F. R. Stevens.
Feb.	20,	Summit Station,	Schuylkill,	Chas. T. Cornman, Dr. J. H. Funk and Prof. F. R. Stevens.
Feb.	21-22,	Strausstown,	Berks,	Chas. T. Cornman, Mrs. Edith E. Smith and Joel A. Herr.
Feb.	24-25,	Topton,	Berks,	Chas. T. Cornman, Mrs. Edith E. Smith and Joel A. Herr.
Feb.	26-27,	Jacksonwald,	Berks,	W. Theo. Wittman, Mrs. Edith E. Smith and Joel A. Herr.
Feb. 28,	Mar. 1,	Geigertown,	Berks,	W. Theo. Wittman, Mrs. Edith E. Smith and Joel A. Herr.
March	3-4,	Trappe,	Montgomery,	W. Theo. Wittman and Mrs. Edith E. Smith.
March	5-6,	Centre Point,	Montgomery,	W. Theo. Wittman and Mrs. Edith E. Smith.
March	7-8,	Salfordsville,	Montgomery,	W. Theo. Wittman and Mrs. Edith E. Smith.
March	10-11,	East Greenville,	Montgomery,	W. Theo. Wittman and Mrs. Edith E. Smith.

MOVABLE INSTITUTE SCHOOLS

DIRECTIONS TO COUNTY CHAIRMEN AND COMMITTEES OF ARRANGEMENTS

The following outline of Dairy, Horticultural and Poultry Topics form the basis of such instruction as will be taken up at the Movable Institute Schools. At a four-day meeting, two days will be devoted to Dairy Instruction and two days divided between Horticulture and Poultry Interests. In preparing program, please select such topics as will be best suited for your locality, arranging for the speakers on such days as they are scheduled in Institute Bulletin. We recommend that at least one session relating to the Dairy Barn, Its Ventilation, etc., be held in a suitable Dairy Barn, also that one Horticultural Session be held in a nearby Orchard, if the weather will permit. A lady speaker will be in attendance at one or more days at each school to give instruction on Household Economics, Home Sanitation and Domestic Science and should be placed on program for evening session.

SCHOOL OF HORTICULTURE

Session I

Subject: *How a tree grows.*
- Root system:
    - Structure of root
    - Functions
    - Absorption of food
    - Conduction
    - Effect of root pruning
    - Root injury.
- Trunk and branches:
    - Structure of stem
    - What is cambium
    - Function of stem
    - Buds
    - Relative to pruning.
- Foliage:
    - Structure of leaf
    - Development
    - Assimilation
    - Evaporation of water
    - Effect of loss or injury of foliage.
- The flower and fruit:
    - Structure
    - Pollination
    - Quality
    - Color.

Practicum—An hour will be devoted to the examination of prepared sections of roots, stems and leaves with the use of the compound microscope.

Session II

Subject—*Horticultural Literature.*

- Value of Books, Reports and Bulletins.
- How to obtain publications.
- Free publications:
  - Issued by U. S. Dept. of Agr.
  - Issued by State Dept. of Agr.
  - Issued by Experimental Stations.
  - Issued by Nursery Firms.
- Other publications:
  - Technical reports of U. S. Dept. of Agr., that must be purchased.
  - Periodicals.
  - Valuable books on Horticulture.
- How to use literature.
- How to use the Experiment Station.
- Value of writing for publication.
- Value of conventions.
- Practicum—Review and discussion of assigned literature by members on selected subjects.

Session III

Subject—*How to feed a tree.*

- Methods of tillage:
  - The timothy crop
  - Mulches—sod mulch
    - —Hitching's method
  - Pasturing orchards
  - Cultivation
  - Intercropping
  - Cover crops.
- Fertilizers:
  - Barnyard manure
  - Wood ashes
  - Lime
  - Commercial fertilizers
- Practicum—Pruning in a local orchard.

Session IV

Subject—*Varieties of fruits.*

  - Origin of varieties
  - Improvement by selection

Improvement by cross breeding
Top working varieties
Adaptation of varieties
Importance of local varieties
Change of latitude
Self sterility of fruits
Mixing varieties in orchards
How to choose varieties
Types of apples.

Practicum—To be announced.

Session V

BUSINESS PROBLEMS OF THE ORCHARD

Subject—*Harvesting and Marketing Fruit.*

When to pick and how
Picking devices
Effect of sun on picked fruit
Effect of rain on picked fruit
Effect of frost on picked fruit
Packing and packages
Packing houses and conveniences
Storing and storing houses
Shipping—associations
Demands of the market
Value of business methods
Value of cooperation.

Practicum—To be announced.

Session VI

Subject—*Insect enemies.*

Codling moth
Apple tree borer
Scale insects
Canker worm
Peach tree borer
Curculios
Rose Chafer.

Each insect will be considered in regard to the following points:

Life history of the insect
Injury to plants
How to identify
Remedies and treatment.

Practicum—Collection and study of insect pests by the members of the school in local orchards and gardens.

Session VII

Subject—*Fungous Diseases.*
Apple scale
Apple leaf spot
Apple rust
Apple twig blight
Apple canker
Crown gall
Peach Yellows
Leaf curl
Brown rot
Pear tree blight
Pear leaf blight.

Each disease will be considered in regard to the following points:
The outward symptoms
The casual fungus or bacterium
The plants and parts affected
Remedies.

Practicum—A search in local orchards will be made by members for any diseased material for study and identification.

SCHOOL OF DAIRYING

Subject—*The Dairy Barn.*
Plan and arrangement
Its convenience
Tools and implements, where kept and what are needed.
The cow stall
Material of stall
The dimensions
The floor drop
Manure gutter; how made.

Practicum—An hour will be devoted to the examination of the Dairy Barn.

Subject—*Light.*
Windows, where located
How constructed
Effect upon the animal.

Subject—*Ventilation.*
A suitable intake system
The outlet for air
Convenient arrangement of doors and chutes
Ceiling construction.

Subject—*How to feed.*
Extravagant feeding
Long hay, fodder and ground grain
Exposure to sun, storms and rains.

Subject—*Profitable feeding.*
Short cut hay, fodder and ensilage
Ground grain and products of mills
Balance the feed to suit the cow
How to balance a ration
How to count profit and loss in feeding
Best hay, fodder and silage
How often should cows be fed.

Subject—*Care and management of the cow.*
How to keep a cow warm in winter
How to water and salt a cow
How to curry, bed and clean a cow.

Subject—*The dairy cow.*
Her breeding; the sire and dam
Conformation
The proper formed udder and teats.

Subject—*Raising the calf.*
What does it cost to raise a calf to be a cow
How fed
When fed
What shall constitute the feed.

Practice in testing milk products.

Testing of samples to show variations daily, time of milking, first and last milk, daily, speed, temperature, flushing.

Butter judging, acid test, fermentations.

Test three-day comp. samples from different herds. Cows to be in pairs same time in milk.

Lecture on cream ripening with cream to be set.

Churning and packing for market accompanied by explanation.

EXERCISE I

BABCOCK TEST: The quality of milk and cream depends largely on the butter-fat in it.

To learn the amount of fat find the weight of milk and the per cent. of fat.

The Babcock Test merely tells what per cent. of the material is fat.

THE PRINCIPLE: The breaking up of the milk, or cream, etc., by sulphuric acid setting the fat free; separating it from the other constituents by means of centrifugal force, this being done in a bottle graduated to show the per cent. of fat.

VITAL: Features are a fair sample, an accurate measure of the amount used, complete separation, and accurate reading of the results, at proper temperature.

THE MILK: To be tested, fair sample, thoroughly mixed, pouring if practicable, sample measured with a pipette, 17.6 c. c. See that end is not broken. Milk should be ordinary room temperature.

THE ACID: Commercial sulphuric, strength, 1:82 sp. gr.; amount, 17.5 c. c.

Strong acid chars the fat—use less of it.

Weak acid shows white sediment in fat column, use more of it.

Slant bottle so ingoing acid runs down side of bottle. Mix with the milk at once.

Whirl five minutes, add hot water up to neck, whirl one minute, add water to 8 mark, whirl one minute, read. If using hand tester and room is cool, place bottle in bath at 120 for two or three minutes before reading.

Read from top of upper meniscus to bottom of lower.

Empty while warm, rinse, wash with alkali water, rinse.

CREAM: To test it the amount required should be weighed into the sample bottle, because the variation in its richness, the amount that will adhere to the pipette and the gas and air mixed in it by hauling or standing, make it impossible to measure the required amount accurately. The amount, 18 grains, or half this amount, in the latter case, with the ordinary cream bottle the reading would have to be doubled.

The amount of aid used with cream should be reduced a little, and after it is mixed with the cream should be allowed to stand a few minutes.

SKIM MILK: Tested the same as whole milk, except that a little more acid is required. The speed of the tester should be increased. A double neck skim milk bottle is required, especially for separator skim milk.

EXERCISE 11

The per cent. of fat in milk varies with different cows, with different breeds, with the same cow from day to day, from one milking to another, with change of feed, change of weather, fright, abuse, noise that is unusual, if not accustomed to them, the presence of strangers at milking time may cause variation. The per cent. of fat in the milk is usually lower soon after the cow is fresh, than it is later in the period of lactation; with many cows the per cent. of increase slightly as the cow gets older. It is usually highest for the shortest period between milkings, and when these are equal for the one during which there has been most activity. The per cent. of fat is more influenced by nervous condition of the animal and individuality than by feed.

In separator cream, the per cent. of fat varies, because of variation of the per cent. of fat in the milk separated, temperature of milk at separating time, fullness of the supply can, speed of the separator, the amount of skim milk, or water, used in flushing the bowl.

In separator skim milk the increased per cent. of fat may be due, slow speed of separator, cold milk, irregular speed, machine not standing steady and firm.

EXERCISE III

Scoring butter according to a score card, is but expressing in mathematical terms, the quality of butter. As yet no way has been devised for measuring the quality of butter, except to depend on the judgment of those skilled in the work. The score card:

Flavor,	45
Body,	25
Color,	15
Salt ,	10
Style,	5
Total,	100

FLAVOR: Should be mild rich creamy, with a delicate mild pleasant aroma.

Some of the common faults of flavor; flat, lacking in the flavor due to proper development of the lactic acid, rancid due to over ripe cream, old cream, unclean, showing the effect of unclean milking, unclean utensils, surroundings, or methods. Weedy, presence of flavors probably caused by undesirable feeds. Feverish, from milk from cows not in good health or too soon after freshening, or during sexual excitement. Smothered, due to closing the can of milk before properly cooling, or exposing closed can of milk to hot sun enroute to creamery. Fruity, or vegetable flavors, caused by presence of decaying vegetables or fruit. Dish rag, due to wiping utensils with the dish cloth, instead of thoroughly scalding with boiling water and allowing to dry.

BODY: Should be firm and wavy, not brittle, greasy, tallowy, spongy, sticky, or salvy.

COLOR: Should be uniform and even, free from streaks, mottles, curds.

SALT: Should be of desired amount, thoroughly dissolved, free from grit and evenly distributed.

STYLE: Package should be neat, clean, and tight.

EXERCISE IV

This exercise to be devoted to testing samples of milk brought in by members of the class, and taken so as to show the difference in the variations in the composition of milk. To emphasize the value of knowing what each cow is producing in return for the feed she is consuming, to show how an approximate record may be kept with little real work.

Material required for keeping such records.

A spring balance, good one costs $4.00 though a much cheaper one will answer fairly well.

Sample jars, one for each cow, may be common fruit jars or milk jars, but should have covers.

A Babcock Tester that need not cost over $5.00.

The discovery of and removal from the herd of one or two cows that are eating more dollars worth of grain, hay and pasture than they are producing milk and butter fat to pay for will many times over pay for the labor and expense involved, especially when it is recalled that some cows produce $75.00 and $80.00 worth of butter fat for $35.00 or $40.00 worth of feed.

EXERCISE V

Principles of Sanitary Milk Production.

Facts of Value to Dairymen about Bacteria in Milk.

Inside the Cows Udder. (Illustrated with charts.)

A milk sheet, which may be ruled up on common brown paper as follows:

DATE.	Name of Cow.	Name of Cow.	Name of Cow.	Name of Cow.	

SCHOOL OF POULTRY HUSBANDRY

Subject—*Breeds.*

Short history of the various breeds. Origin, types and future advantages of pure bred flocks.

Principals of breeding, particularly along the line of increased egg production.

Effects of selection, cross-breeding, line breeding and inbreeding.

Subject—*Foods and Feeding.*

Purposes of feeding.

Comparative value of the various grains.

How best to feed and when.
Feeding for eggs, for growth, for fattening, etc.
Green food, animal food, shell and bone food, charcoal condiments.

Subject—*Houses and Yards.*
Colony, continuous house and free range plans.
Situations, soils and exposures.
Advantages of low cost, construction and simplicity.
Wide open and curtain front, fresh air houses.

Subject—*Easy and Simple Methods of Poultry Keeping.*
Why such methods are best.
Where most people fall down.
Advantages of poultry keeping; vast importance and extent of same.

Subject—*Incubation.*
The advantages and disadvantages of natural and artificial incubation compared.
Necessary adjuncts of good hatches.

Subject—*Brooding and Rearing.*
Natural methods of brooding.
Cold brooders; artificially heated brooders.
The first feed for chicks.
Extreme importance and desirability of uninterrupted or unchecked growth.

Subject—*Winter Egg Production.*
Factors making the same.
Selecting and handling the layers.
Housing and feeding.
Marketing the eggs.

Note—Besides the list of the various Poultry Journals and the bulletins on Poultry Keeping issued by the National and various State Departments of Agriculture, those interested in Poultry Keeping should secure and study Poultry Craft, by Robinson; Progressive Poultry Culture, by Bingham; The New Book on Poultry, by Wright; Poultry Culture, by Felch; and A Living from Poultry, by Boyer.

MOVABLE INSTITUTE SCHOOLS

SEASON 1912-1913

Date	Place	County	Additional Lecturers.
Jan. 27-28,	Apollo,	Westmoreland,	Dr. J. H. Funk and W. Theo. Wittman.
Jan. 29-30,	Apollo,	Westmoreland,	Dr. M. E. Conard, Dr. Louis A. Klein and R. J. Weld.
Jan. 29-30,	New Wilmington,	Lawrence,	Dr. J. H. Funk and W Theo. Wittman.

Date.	Place.	County	Additional Lecturers.
Jan. 31, Feb. 1,	New Wilmington,	Lawrence,	Dr. M. E. Conard, Dr. Louis A. Klein and R. J. Weld.
Jan. 31, Feb. 1,	Waterford,	Erie,	Dr. J. H. Funk and W. Theo. Wittman.
Feb., 3-4,	Waterford,	Erie,	Dr. M. E. Conard, Dr. Louis A. Klein and R. J. Weld.
Feb. 3-4,	Millville,	Columbia,	Dr. J. H. Funk and W. Theo. Wittman.
Feb. 6,	Millville,	Columbia,	Dr. M. E. Conard, Dr. Louis A. Klein and R. J. Weld.
Feb. 5-6,	Lime Ridge,	Columbia,	Dr. J. H. Funk and W. Theo. Wittman.
Feb. 7-8,	Lime Ridge,	Columbia,	Dr. M. E. Conard, Dr. Louis A. Klein and R. J. Weld.

LIST OF SPEAKERS AND THEIR ASSIGNMENTS

FOR THE SEASON OF 1912-1913

H. M. ANDERSON, New Park, York County, Pa.

Date.	Place.	County.
March 12-13,	Middleown,	Dauphin.
March 14-15,	Linglestown,	Dauphin.
March 17-18,	Gratz,	Dauphin.

ERNEST L. ANTHONY, State College, Center County, Pa.

Feb. 3,	Weatherly,	Carbon.
Feb. 4,	Big Creek,	Carbon.
Feb. 5-6,	New Mahoning,	Carbon.
Feb. 7-8,	New Tripoli,	Carbon.

CHAS. M. BARNITZ, Riverside, Northumberland County, Pa.

Jan. 27-28,	Hendersonville,	Mercer.
Jan. 29-30,	Fredonia,	Mercer.
Jan. 31, Feb. 1,	West Middlesex,	Mercer.
Feb. 3-4,	Pulaski,	Lawrence.
Feb. 5-6,	Princeton,	Lawrence.
Feb. 7-8,	Plaingrove,	Lawrence.

M. S. BOND, Danville, Montour County, Pa.

Nov. 26-27,	McConnellsburg,	Fulton.
Nov. 29-30,	Needmore,	Fulton.

J. T. CAMPBELL, Hartstown, Crawford County, Pa.

Will attend all meetings in the Second Section.

FRED W. CARD, Sylvania, Bradford County, Pa.

Will attend all meetings in the Fourth Section from Dec. 16 to Jan. 18 and the Second Section from Jan. 27 to March 15.

M. N. CLARK, Claridge, Westmoreland County, Pa.

Jan. 8-9,	Boswell,	Somerset.
Jan. 10-11,	Somerset,	Somerset.

DR. M. E. CONARD, Westgrove, Chester County, Pa.

Will attend all meetings in the Fifth Section from Dec. 16 to Dec. 23; Third Section Dec. 30 to Jan. 18; Movable Institute Schools from Jan. 29 to Feb. 8; Third Section Feb. 10 to March 15.

CHAS. T. CORNMAN, Carlisle, Cumberland County, Pa.

Date.		Place.	County.
Feb.	14-15,	McKeansburg,	Schuylkill.
Feb.	17-18,	Valley View,	Schuylkill.
Feb.	19,	Friedensburg,	Schuylkill.
Feb.	20,	Summit Station,	Schuylkill.
Feb.	21-22,	Strausstown,	Berks.
Feb.	24-25,	Topton,	Berks.
March	12-13,	Middletown,	Dauphin.
March	14-15,	Linglestown,	Dauphin.
March	17-18,	Gratz,	Dauphin.

H. R. DAVIS, State College, Centre County, Pa.

Nov.	29-30,	St. Marys,	Elk.
Dec.	2-3,	Weedville,	Elk.
Dec.	4-5,	Kirkman,	Jefferson.
Dec.	6-7,	Stanton,	Jefferson.

E. B. DORSETT, Mansfield, Tioga County, Pa.

Will attend all meetings on the Fourth Section Nov. 29 to Dec. 21; Second Section Jan. 6 to Jan. 11 and the First Section from March 13 to March 18.

W. M. C. DRAKE, Volant, Lawrence County, Pa.

Dec.	16-17,	Miola	Clarion.
Dec.	18-19,	Blairs Corners,	Clarion.
Dec.	20-21,	Limestone,	Clarion.

F. H. FASSETT, Meshoppen, Wyoming County, Pa.

Will attend all meetings in the First Section Nov. 29 to Dec. 21 and the Third Section from Dec. 30 to March 8.

MRS. JEAN KANE FOULKE, West Chester, Chester County, Pa.

Feb.	3,	Weatherly,	Carbon.
Feb.	4,	Big Creek,	Carbon.
Feb.	5-6,	New Mahoning,	Carbon.
Feb.	7-8,	New Tripoli,	Lehigh.
Feb.	10-11,	Laurys,	Lehigh.
Feb.	12-13,	Alburtis,	Lehigh.
Feb.	14-15,	Richlandtown,	Bucks.

Date.		Place.	County.
Feb.	17-18,	Blooming Glen,	Bucks.
Feb.	19-20,	Pineville,	Bucks.
Feb.	21-22,	Newtown,	Bucks.
March	10-11,	New Kensington,	Westmoreland.
March	12-13,	New Alexandria,	Westmoreland.
March	14-15,	Scottdale,	Westmoreland.

EMORY S. FOWLER, 72 West Adams St., Chicago, Ill.

Jan.	1-2,	Lottsville,	Warren.
Jan.	3-4,	Columbus,	Warren.
Jan.	6-7,	Cambridge Springs,	Crawford.
Jan.	8-9,	Saegerstown,	Crawford.
Jan.	10-11,	Guys Mills,	Crawford.
Jan.	13-14,	Hughesville,	Lycoming.
Jan.	15-16,	East Lemon,	Wyoming.
Jan.	17-18,	Tunkhannock,	Wyoming.
Jan.	27-28,	Hendersonville,	Mercer.
Jan.	29-30,	Fredonia,	Mercer.
Jan. 31,	Feb. 1,	West Middlesex,	Mercer.
Feb.	3-4,	White Hall,	Montour.
Feb.	5-6,	Mausdale,	Montour.
Feb.	7-8,	Liberty,	Tioga.
Feb.	10-11,	Mansfield,	Tioga.
Feb.	12-13,	Freeburg,	Snyder.
Feb.	14-15,	Beavertown,	Snyder.
Feb.	17-18,	Trough Creek,	Huntingdon.
Feb.	19-20,	Merklesburg,	Huntingdon.
Feb.	21-22,	Petersburg,	Huntingdon.
Feb.	24-25,	Cross Creek,	Washington.
Feb.	26-27,	Hickory,	Washington.

DR. J. H. FUNK, Boyertown, Berks County, Pa.

Will attend all meetings in the First Section Dec. 27 to Jan. 21; Movable Institute Schools from Jan. 27 to Feb. 6 and in the Fifth Section from Feb. 10 to Feb. 20, and Special Institute, West Chester, Dec. 5-6.

SHELDON W. FUNK, Boyertown, Berks County, Pa.

Will attend all meetings in the Second Section from Dec. 27 to Jan. 4; Fifth Section Jan. 6 to Jan. 18 and the First Section from Jan. 27 to March 21.

PROF. FRANK D. GARDNER, State College, Centre County, Pa.

Dec.	2-3,	Wilmore,	Cambria.
Dec.	4-5,	Chest Springs,	Cambria.
Dec.	6-7,	Cross Roads Grange Hall,	Cambria.

G. C. GIVEN, State College, Center County, Pa.

Date.	Place.	County.
Jan. 27-28,	Estella,	Sullivan.
Jan. 29-30,	Wilmont,	Bradford.
Jan. 31, Feb. 1,	Lime Hill,	Bradford.
Feb. 3-4,	Leraysville,	Bradford.
Feb. 5-6,	Wysox,	Bradford.
Feb. 7-8,	Liberty,	Tioga.

H. M. GOODERHAM, Patton, Cambria County, Pa.

Jan. 6-7,	Tompkinsville,	Lackawanna.
Jan. 8-9,	Clarks Summit,	Lackawanna.
Jan. 10-11,	Madisonville,	Lackawanna.

C. L. GOODLING, State College, Center County, Pa.

Jan. 13-14,	Dallas,	Luzerne.
Jan. 15-16,	Orange,	Luzerne.
Jan. 17-18,	Hobbie,	Luzerne.

C. C. HULSART, Matawan, N. J.

Feb. 24-25,	Bustleton,	Philadelphia.
Feb. 26-27,	Media,	Delaware.
Feb. 28, Mar. 1,	Concordville,	Delaware.
March 3-4,	Oxford,	Chester.
March 5-6,	Unionville,	Chester.
March 7-8,	Avondale,	Chester.
March 10-11,	Cedarville,	Chester.

H. H. HAVNER, State College, Centre County, Pa.

Dec. 13-14,	Thompsontown,	Juniata.

JOEL A. HERR, Millhall, Clinton County, Pa.

Feb. 21-22,	Strausstown,	Berks.
Feb. 24-25,	Topton,	Berks.
Feb. 26-27,	Jacksonwald,	Berks.
Feb. 28, Mar. 1,	Geigertown,	Berks.

E. K. HIBSHMAN, Ephrata, Lancaster County, Pa.

Jan. 27-28,	Annville,	Lebanon.
Jan. 29-30,	Schaefferstown,	Lebanon.
Jan. 31, Feb. 1,	Jonestown,	Lebanon.
Feb. 3-4,	Cross Roads,	York.
Feb. 5-6,	Loganville,	York.
Feb. 7-8,	Red Lion,	York.
Feb. 10-11,	Manchester,	York.
Feb. 12-13,	Wellsville,	York.

J. B. JOHNSTON, New Wilmington, Lawrence County, Pa.

Date.	Place.	County.
Nov. 29-30,	Fayette City,	Fayette.
Dec. 2-3,	Laurel Hill,	Fayette.
Dec. 4 5,	Dawson,	Fayette.
Dec. 6-7,	Kuhntown,	Greene.
Dec. 9-10,	Mt. Pleasant Church,	Greene.

R. P. KESTER, Grampian, Clearfield County, Pa.

Will attend all meetings in the First Section.

PROF. MILLIGAN C. KILPATRICK, State College, Center Co., Pa.

Dec. 21,	Beaver,	Beaver.

DR. LOUIS A. KLEIN, University of Pennsylvania, Philadelphia, Pa.

Jan. 29-30,	Apollo,	Westmoreland.
Jan. 31, Feb. 1,	New Wilmington,	Lawrence.
Feb. 3-4,	Waterford,	Erie.
Feb. 6,	Millville,	Columbia.
Feb. 7-8,	Lime Ridge,	Columbia.

FRANK KLINE, Spring City, Chester County, Pa.

Feb. 10-11,	Jackville,	Butler.
Feb. 12-13,	West Sunbury,	Butler.
Feb. 14-15,	Eureka Grange,	Butler.
Feb. 17-18,	Millertown,	Allegheny.
Feb. 19-20,	New Texas,	Allegheny.
Feb. 21-22,	Imperial,	Allegheny.

L. W. LIGHTY, East Berlin, Adams County, Pa.

Will attend all meetings in the Fourth Section.

PROF. T. I. MAIRS, State College, Center County, Pa.

Nov. 29-30,	Fayette City,	Fayette.
Dec. 2-3,	Laurel Hill,	Fayette.
Dec. 4-5,	Dawson,	Fayette.
Dec. 6-7,	Kuhntown,	Greene.
Dec. 9-10,	Mt. Pleasant Church,	Greene.

M. H. McCALLUM, Wernersville, Berks County, Pa.

Will attend all meetings in the Fifth Section from Nov. 29 to Dec. 23 and the Second Section from Feb. 3 to March 15.

PROF. FRANKLIN MENGES, York, York County, Pa.

Will attend all meetings in Third Section.

HOWARD MITMAN, Hellertown, Northampton County, Pa.

Date.		Place.	County.
Dec.	28,	Honesdale,	Wayne.
Dec.	30-31,	Aldenville,	Wayne.
Jan.	1-2,	Pleasant Mt.,	Wayne.
Jan.	3-4,	Lakewood,	Wayne.

D. E. MURRAY, Catawissa, Columbia County, Pa.

Jan	27-28,	Estella,	Sullivan.
Jan.	29-30,	Wilmont,	Bradford.
Jan.	31, Feb. 1,	Lime Hill,	Bradford.
Feb.	3-4,	Leraysville,	Bradford.
Feb.	5-6,	Wysox,	Bradford.
Feb.	7-8,	Liberty,	Tioga.

W. M. PATTON, Mosgrove, R. F. D. No. 2, Armstrong Co., Pa.

Dec.	27,	Rich Valley,	Cameron.
Dec.	28,	Howards,	Cameron.
Dec.	30,	Sizerville,	Cameron.
Dec.	31,	Driftwood,	Cameron.
Jan.	1-2,	Woolrich,	Clinton.
Jan.	3-4,	Salona,	Clinton.
Jan.	6-7,	Beech Creek,	Clinton.
Jan.	8-9,	Pine Run,	Lycoming.
Jan.	10-11,	Limestone,	Lycoming.
Jan.	13-14,	Hughesville,	Lycoming.
Jan.	15-16,	East Lemon,	Wyoming.
Jan.	17-18,	Tunkhannock,	Wyoming.

J. H. PEACHEY, Belleville, Mifflin County, Pa.

Nov.	29-30,	St. Marys,	Elk.
Dec.	2-3,	Weedville,	Elk.
Dec.	4-5,	Kirkman,	Jefferson.
Dec.	6-7,	Stanton,	Jefferson.

T. J. PHILIPS, Atglen, Chester County, Pa.

Dec.	27-28,	Markelsville,	Perry.
Dec.	30-31,	Blain,	Perry.

E. L. PHILLIPS, New Bethlehem, R. F. D. No. 2, Clarion County, Pa.

Date.	Place.	County.
Dec. 16-17,	Lititz,	Lancaster.
Dec. 18-19,	Ephrata,	Lancaster.
Dec. 20-21,	Maytown,	Lancaster.
Feb. 26-27,	Port Allegany,	McKean.
March 1,	Kane,	McKean.
March 3-4,	Clarington,	Forest.
March 5-6,	Tionesta,	Forest.
March 7-8,	Girard,	Erie.

DR. W. T. PHILLIPY, Carlisle, Cumberland County, Pa.

Dec. 5-6,	West Chester,	Chester.
Jan. 27-28,	Mt. Bethel,	Northampton.
Jan. 29-30,	Nazareth,	Northampton.
Jan. 31, Feb. 1,	Cherryville,	Northampton.

CHARLES A. ROW, Yardley, Bucks County, Pa.

Jan. 27-28,	Annville,	Lebanon.
Jan. 29-30,	Schaefferstown,	Lebanon.
Jan. 31, Feb. 1,	Jonestown,	Lebanon.
Feb. 3-4,	Cross Roads,	York.
Feb. 5-6,	Loganville,	York.
Feb. 7-8,	Red Lion,	York.
Feb. 10-11,	Manchester,	York.
Feb. 12-13,	Wellsville,	York.

J. A. RUNK, Green Ridge, Md.

Feb. 10-11,	Mansfield,	Tioga.
Feb. 12-13,	Mitchells Mills,	Tioga.
Feb. 14-15,	Wellsboro,	Tioga.
Feb. 17-18,	Westfield,	Tioga.
Feb. 19-20,	Genessee,	Potter.
Feb. 21-22,	Shingle House,	Potter.
Feb. 24,	Clara,	Potter.
Feb. 25,	Coryville,	McKean.
Feb. 26-27,	Port Allegany,	McKean.
March 1,	Kane,	McKean.
March 3-4,	Clarington,	Forest.
March 5-6,	Tionesta,	Forest.
March 7-8,	Girard,	Erie.

ROBT. S. SEEDS, Birmingham, Huntingdon County, Pa.

Nov. 29,	Lawsville,	Susquehanna.
Nov. 30,	Montrose,	Susquehanna.
Dec. 2-3,	Harford,	Susquehanna.
Dec. 4-5,	Clifford,	Susquehanna.
Dec. 6-7,	Greentown,	Pike.
Dec. 16-17,	East Waterford,	Juniata.
Dec. 18-19,	Lewistown,	Mifflin.

Date.	Place.	County.
Dec. 20-21,	Belleville,	Mifflin.
Dec. 28,	Honesdale,	Wayne.
Dec. 30-31,	Aldenville,	Wayne.
Jan. 1-2,	Pleasant Mt.,	Wayne.
Jan. 3-4,	Lakewood,	Wayne.

MRS. EDITH E. SMITH, Pennsdale, Lycoming County, Pa.

Dec. 5-6,	West Chester,	Chester.
Jan. 27-28,	Rebuck,	Northumberland.
Jan. 29-30,	Pottsgrove,	Northumberland.
Jan. 31, Feb. 1,	Watsontown,	Northumberland.
Feb. 21-22,	Strausstown,	Berks.
Feb. 24-25,	Topton,	Berks.
Feb. 26-27,	Jaksonwald,	Berks.
Feb. 28, Mar. 1,	Geigertown,	Berks.
March 3-4,	Trappe,	Montgomery.
March 5-6,	Centre Point,	Montgomery.
March 7-8,	Salfordsville,	Montgomery.
March 10-11,	East Greenville,	Montgomery.

A. W. STEPHENS, Hoboken, Allegheny County, Pa.

Dec. 16-17,	New Bethlehem,	Beaver.
Dec. 18-19,	Darlington,	Beaver.
Dec. 20-21,	Beaver,	Beaver.

PROF. F. R. STEVENS, Geneva, N. Y.

Jan. 13-14,	Dallas,	Luzerne.
Jan. 15-16,	Orange,	Luzerne.
Jan. 17-18,	Hobbie,	Luzerne.
Jan. 27-28,	Estella,	Sullivan.
Jan. 29-30,	Wilmont,	Bradford.
Jan. 31, Feb. 1,	Lime Hill,	Bradford.
Feb. 3-4,	Leraysville,	Bradford.
Feb. 5-6,	Wysox,	Bradford.
Feb. 10-11,	Laurys,	Lehigh.
Feb. 12-13,	Alburtis,	Lehigh.
Feb. 14-15,	McKeansburg,	Schuylkill.
Feb. 17-18,	Valley View,	Schuylkill.
Feb. 19,	Friedensburg,	Schuylkill.
Feb. 20,	Summit Station,	Schuylkill.

W. H. STOUT, Pinegrove, Schuylkill County, Pa.

Jan. 27-28,	Mt. Bethel,	Northampton.
Jan. 29-30,	Nazareth,	Northampton.
Jan. 31, Feb. 1,	Cherryville,	Northampton.

LEON OTICE VAN NOY, Troy, R. D. No. 66, Bradford County, Pa.

Will attend all meetings in the Second Section from Nov. 26 to Feb. 1 and the Third Section from Feb. 3 to Feb. 8.

D. H. WATTS, Kerrmoor, Clearfield County, Pa.

Will attend all meetings in the Fifth Section.

W. THEO. WITTMAN, Allentown, Lehigh County, Pa.

Will attend all meetings in the First Section Nov. 29 to Dec. 7 and Jan. 1 to Jan. 21; Movable Institute Schools Jan. 27 to Feb. 6; Fourth Section Feb. 10 to Feb. 25 and the Fifth Section Feb. 26 to March 11.

R. J. WELD, Sugargrove, Warren County, Pa.

Date.	Place.	County.
Dec. 16-17,	New Bethlehem,	Beaver.
Dec. 18-19,	Darlington,	Beaver.
Dec. 20-21,	Beaver,	Beaver.
Jan. 29-30,	Apollo,	Westmoreland.
Jan. 31, Feb. 1,	New Wilmington,	Lawrence.
Feb. 3-4,	Waterford,	Erie.
Feb. 6,	Millville,	Columbia.
Feb. 7-8,	Lime Ridge,	Columbia.

W. R. WHITE, State College, Center County, Pa.

Jan. 13-14,	Berlin,	Somerset.
Jan. 15-16,	Mench,	Bedford.
Jan. 17-18,	Woodbury,	Bedford.

GENERAL LIST OF INSTITUTE LECTURERS WITH THEIR SUBJECTS

1912-1913

ANDERSON, H. M., New Park, Pa.:

1. Corn Culture.
2. Leguminous Crops.
3. Orchard Management.
4. Conservation of Soil Moisture.
5. Home Mixed Fertilizers.
6. Potato Culture. (30 to 40 minutes each.)

ANTHONY, ERNEST L., State College, Pa.:

1. The Ear Marks of a Dairy Cow.
2. A pound of Farm Butter.
3. Why a Cow Testing Association. (30 minutes each.)

ARNY, L. WAYNE, New Britain, Pa.:

1. Making the Home Orchard Profitable.
2. Fruit Growing in Pennsylvania.
3. Agricultural Education.
4. Spraying and Spraying Materials.
5. Some Economic Insects. (30 to 40 minutes each.)

BARNITZ, CHARLES M., Riverside, Pa.:

1. Mother Hen; Her Brood and Their Care.
2. The Chick from Shell to Maturity. (Illustrated by lantern slides.)
3. Turkey Raising; How to Succeed. (Illustrated by lantern slides.)
4. Common Diseases of Poultry; Their Prevention and Cure. (Illustrated by lantern slides.)
5. Poultry Parasites; Their Description and Destruction.
6. Artificial Incubation and Brooding.
7. Best Farm Breeds and Their Needs.
8. Feeding for Winter Eggs.
9. Finishing Turkeys, Ducks and Chickens for market.
10. The Modern Poultry House; Its Location, Construction and Furniture.
11. The Farm Boys Welfare. (Evening.) (30 to 40 minutes each.)

Note: When slides are to be used with Nos. 2, 3 and 4 Chairmen must notify.

BOND, M. S., Danville, Pa.:

1. Thirty-five Years' Experience with Commercial Fertilizers.
2. Potato Culture.
3. Some of the Problems as to use of Lime.
4. Intensive Agriculture.
5. Why to the Boys and Girls Leave the Farm.
6. Results of Farmers' Organizations. (20 to 30 minutes each.)

CAMPBELL, J. T., Hartstown, Pa.:

1. Poultry (a) Houses and Fixtures. (40 minutes.)
    (b) Breeds and Breeding. (40 minutes.)
    (c) Foods and Feeding. (45 minutes.)
    (d) Lice, Gapes and Diseases. (30 minutes.)
    (e) Feeding and Care of Little Chicks. (30 minutes.)
    (f) Incubators and Brooders. (40 minutes.)
2. The Work of the Farmers' Institutes. (20 minutes.)
3. The Basic Principals of Soil Improvement. (40 minutes.)
4. Economic Maintenance of the Productive Power of the Soil. (40 minutes.)
5. Poultry Farming as a Business. (40 minutes.)
6. New Poultry Problems. (50 minutes.)
7. The Making of the Soil. (Lantern Slides.) (45 minutes.)
8. The Modern Country Home. (40 minutes.)
9. The Farm of Life. (Evening lecture.) (60 minutes.)

CARD, FRED W., Sylvania, Pa.:

1. Nature's Laboratory; The Soil.
2. Propagation, Planting and Care of Fruit Trees.
3. Some Business Phases of Fruit Growing.
4. Business Problems of the Farm.
5. Pigs and Pin-money.
6. Trees, Shrubs and Flowers for the Farm Home.
7. The Call of the Land. (Primarily for Young People.)
8. What Shall We Teach? (Evening.)
9. Some Things Outside the Farmyard Gate. (Evening.) (30 to 45 minutes.)

CLARK, M. N., Claridge, Pa.:

1. Marketing the Products of the Farm.
2. To Grow the Peach Successfully.
3. Some of the Mistakes Many Farmers Make.
4. Theory and a Practical Education.
5. Has the Grange Helped the Farmer.
6. A Money Maker, "Grow Hogs."
7. What Has Become of the Horse Growers.
8. Beautify the Home and Surroundings. (25 to 30 minutes each.)

CONARD, DR. M. E., Westgrove, Pa.:

1. Selecting, Feeding and Raising the Calf to Build up the Dairy Herd.
2. Cow Stable Construction, Sanitary and Comfortable.
3. Comparative Characteristics of the Dairy Breed.
4. Cattle Diseases Effecting the Milk.
5. Essential Points in the Production of Wholesome Milk.
6. Testing Milk for Butter Fat. (Demonstrated.)
7. The Water Supply for the Dairy.
8. Selecting and Breeding Horses for Farm and Market.

CORNMAN, CHAS, T., Carlisle, Pa.:

1. Poultry Husbandry on the Farm.
2. Feeding and Housing Poultry Intelligently.
3. Eggs and What They Mean to the Farmer.
4. Poultry Diseases and Poultry Pests.
5. The Turkey Problem in Pennsylvania.
6. Birds of Pennsylvania; Their Value to the Farmer. (30 minutes each.)

DAVIS, H. P., State College, Center County, Pa.:

1. Making a Grain Mixture for the Dairy Cow. (30 minutes.)
2. The Dairy Sire; How Valuable. (25 minutes.)
3. How Much Milk per Acre. (25 minutes.)

DORSETT, E. B., Mansfield, Pa.:

1. The Silo and Its Uses.
2. The Feed and Care of the Dairy Cow.
3. Building up the Dairy Herd.
4. Agriculture in our Public Schools.
5. Co-operation for the Farmers.
6. Good Roads and What they mean to the Farmer.
7. The Real Factors of a Country Home.
8. America's Uncrowned Queen.

DRAKE, W. M. C., Volant, Pa.:

1. How We may Increase our Soil Fertility.
2. How to Grow Clover.
3. Corn Breeding and Selection of Seed.
4. The Use of Commercial Fertilizer.
5. Raising Horses in Pennsylvania.
6. Potato Growing.
7. Growing a Commercial Orchard.
8. The Future Farmer's Education.
9. The Silo as an Economic Farm Factor.
10. Home Influence. (Evening lecture.) (30 to 40 minutes each.)

FASSETT, F. H., Meshoppen, Pa.:

1. Care and Management of the Orchard.
2. Pruning.
3. Spraying and Marketing.
4. Starting the Orchard.
5. Some Orchard Insects and Remedies.
6. Peaches.
7. Strawberries. (25 to 40 minutes each.)

FOULKE, MRS. JEAN KANE, West Chester, Pa.:

1. Women's Place in Farm Life.
2. The Child on the Farm.
3. The Essentials of Butter Making.
4. Farming as a Profession for Women.
5. Cheap and Easy Means to Health and Comfort.
6. Our Neglected Opportunities.
7. Dynamite as a Factor in Modern Farming.
8. Sub-soiling and Drainage. (40-50 minutes each.)

FOWLER E. S., No. 72 W. Adams St., Chicago, Ill.:

1. Concrete and How to Make It.
2. The Use of Concrete on the Farm.
3. Farm Buildings of Concrete.
4. Cement Products on the Farm.
5. Ornamental Possibilities of Concrete on the Farm.
6. The Concrete Silo and How to Build It. (30 to 40 minutes each.)

FUNK, DR. J. H., Boyertown, Pa.:

1. Commercial Orcharding. (45 minutes.)
2. Pruning, Fertilizing and Thinning. (45 to 60 minutes.)
3. Spraying. (45 minutes.)
4. San Jose Scale and Other Insects. (45 minutes.)
5. Small Fruits. (45 minutes.)
6. The Peach and How to Raise It. (45 minutes.)
7. How a Tree Grows. (Suitable for Schools.) (45 minutes.)
8. Potato Culture. (45 to 60 minutes.)
9. Birds and Insects. (Evening Lecture.) (45 to 60 minutes.)

FUNK, SHELDON W., Boyertown, Pa.:

1. Apple Growing in Pennsylvania.
2. The Spraying of Fruit Trees.
3. Modern Peach Culture.
4. Small Fruit Culture.
5. Market Gardening.
6. Potato Culture.

7. Flowers and Their Care in the Home and Lawn.
8. Commercial Fertilizers and the Value of Home Mixing.
9. An Appeal to Our Farmers' Boys. (Evening Lecture.)
10. Some Wonders of Nature. (Evening.) (30 to 50 minutes each.)

GARDNER, PROF. FRANK D., State College, Pa.:

1. Corn Improvement by Selection, Breeding and Testing.
2. Alfalfa and How to Grow It.
3. Use of Lime on Land.
4. Soil Fertility and How to Maintain It.
5. Principles of Fertilizer Practice.
6. Land Drainage.
7. Use of Concrete on the Farm. (Illustrated by slides.) (30 minutes each.)

GIVEN, G. C., State College, Pa.:

1. Bacteria and Their Functions.
2. Lime.
3. Fertilizers; Home Mixing.
4. The House Fly as a Menace to the Public Health.
5. The Value of Nitrogen-Gathering Plants. (30 minutes each.)

GOODERHAM, H. M., Patton, Pa.:

1. Barn Manures; Their Waste and Treatment.
2. Agriculture and our Rural Schools.
3. Adding Value to our Farms by Improving our Stock.
4. Butter Making on the Farm.
5. Growing Alfalfa.
6. The Boys and the Girls. (Evening Lecture.) (30 to 40 minutes each.)

GOODLING, C. L., State College, Pa.:

1. Economic Production of Milk.
2. Silos and Their Value.
3. Alfalfa Growing.
4. Fertilization of Grasses.
5. Home Mixing Fertilizers. (Illustrated.)
6. Figuring Balanced Rations for Cows. (Illustrated.)
7. The Economic Use of Farm Machinery. (Illustrated.)
8. The Use of Lime on Land. (25 to 30 minutes each.)

HAVNER, H. H., State College, Pa.:

1. Feeding Farm Work Horses.
2. Care and Management of Breeding Stock.
3. Hog Diseases.

4. Udder Troubles.
5. Tuberculosis.
6. Livestock Sanitation.
7. Management of Brood Mares and Stallions. (30 minutes each.)

HULSART, C. C., Matawan, N. J.:

1. Home Mixed V. S., Commercial Fertilizers.
2. Forms and Functions of Fertilizer Ingredients.
3. Humus and Clover Crops.
4. Tomato Culture.
5. Asparagus Culture.
6. Cantaloupe Culture.
7. Small Fruits. (Strawberries and Raspberries.)
8. Market Gardening: The Man, The Business and The Crop.
9. Plant Breeding and Seed Saving by the Farmer.
10. Corn Growing. (40 to 50 minutes.)

HERR, JOEL A., Millhall, Pa.:

1. Intelligent Use of Commercial Fertilizers. (30 minutes.)
2. Modern Road Making. (20 minutes.)
3. Building Up the Farm. (30 minutes.)
4. Selection and Breeding of Dairy Cows. (20 minutes.)
5. The Bright Side of Farm Life. (35 minutes.)
6. What Has Organization Done for the Farmer. (30 minutes.)
7. The Farmer As a Citizen. (20 minutes.)
8. Raising Cows for Market. (20 minutes.)
9. Specialities in Farming. (30 minutes.)
10. The Clover Crop. (30 minutes.)
11. The Value of Wood Lot. (15 minutes.)

HIBSHMAN, E. K., Ephrata, Pa.:

1. Tobacco Breeding. (30 minutes.)
2. Tobacco Fertilizers. (30 minutes.)
3. Handling the Pennsylvania Tobacco Crop. (40 minutes.)
5. Commercial Fertilizers. (30 minutes.)
6. Alfalfa. (30 minutes.)
7. Conservation of Soil Moisture. (30 minutes.)
8. Lancaster County Farming System. (30 minutes.)

JOHNSTON, J. B., New Wilmington, Pa.:

1. Picking, Packing and Storing Apples.
2. Results of Fertilizer Experiments in Mature Apple Orchard.
3. Spraying; When, How and What For.
4. Pruning; When, Why and What For.
5. One Year's Experience with Dynamite in the Young Orchard and the Old One.

KESTER, R. P., Grampian, Pa.:

1. Fertility, Regained and Retained.
    (a) Soil Moisture: Its Necessity and Control.
    (b) Humus: Its Function and Increase.

   - (c) A Grass Sod; Its Necessity and How to Produce It.
   - (d) The Economical Use of Lime, Manure and Fertilizers.
   - (e) Tillage and Tilling Implements.
2. Growing a New Orchard.
3. Improving the Old Orchard.
4. Essentials of Success with Potatoes.
5. The Farmer as a Citizen.
6. The Education we Need.
7. Some Fundamentals of a Country Home.

Note. Any of the above sub-divided topics can be given separately.

KLEIN, DR. LOUIS A., University of Pennsylvania, Philadelphia, Pa.:

1. Facts of Value to Dairymen about Bacteria in Milk.
2. Principles of Sanitary Milk Production.
3. Inside the Cows Udder. (Illustrated with charts.)
4. Sterility or Barrenness in Dairy Cows. (30 to 45 minutes.)

KLINE, FRANK, Spring City, Pa.:

1. Poultry Buildings, Past and Present.
2. Profitable Poultry and Winter Egg Production.
3. Incubation with Hens and Incubators.
4. Brooding and Rearing Chicks for Market and Breeders.
5. Poultry Breeding as a Business and the Best Method for a Beginner. (20 to 35 minutes.)

LIGHTY, L. W., East Berlin, Pa.:

1. Dairying as a Business.
2. The Silo as a Factor on the Dairy Farm.
3. Soiling Crops; How to Handle and Feed Them.
4. Culture and Feeding of the Corn Crop.
5. Producing and Selling Good Milk, Cream and Butter.
6. Value, Care and Handling of Farm Manure.
7. Maintaining and Improving the Fertility of the Soil.
8. The Farm Home As It Should Be.
9. The Rural School As It Should Be. (30 to 40 minutes each.)

MAIRS, PROF. T. I., State College, Pa.:

1. Horse Breeding for Farmers'. (20-30 minute.)
2. Livestock and Soil Fertility. (20-30 minutes.)
3. What Is a Balanced Ration. (15-25 minutes.)
4. School Training for Farm Life. (30-40 minutes.)
5. Rural Sanitation and Hygiene. (20-30 minutes.)
6. Some Rural School Problems. (20-30 minutes.)
7. Alfalfa. (20-30 minutes.)

McCALLUM, M. H., Wernersville, Pa.:

1. Buying and Home Mixing Fertilizers.
2. Use of Commercial Fertilizer.

3. Alfalfa.
4. Forms and Uses of Lime.
5. Essentials of Success with Potatoes.
6. Legumes; Their Relation to Crop Production.
7. Market Gardening. (Any phase, crop or crops.)
8. Things Worth While on the Farm., (Evening.) (25-35 minutes.)

McDOWELL, M. S., State College, Pa.:

1. Soil Fertility.
2. Lime.
3. A Few Facts About Bacteria.
4. Insoluable Phosphate.
5. Known and Unknown.

MENGES, PROF. FRANKLIN, York, Pa.:

1. Maintenance of Soil Fertility and Soil Moisture.
2. Fixation of Free Nitrogen by Soil Bacteria.
3. Methods of Introducing Clovers into Rotations.
4. Methods of Raising Hay.
5. Economy in Crop Production.
6. Benefits of Corn Breeding.
7. Wheat Raising to Increase Yields.
8. Industrial Alcohol in Agriculture.
9. Necessity of Education for the Farmer.
10. Domestic Chemistry in the Country School.
11. Insects in General Farming.

MITMAN, HOWARD, Hellertown, Pa.:

1. Helps and Hindrances in the Poultry Yard.
2. How to Figure a Dairy Ration.
3. Water, The Greatest Thing on the Farm.
4. Tillage; Preparation and Cultivation of the Soil.
5. Farm Tools and Machinery; Their Use and Abuse.
6. Essentials of a Country Home; Real and Imaginary.
7. Education Most Helpful for the Farmers' Sons and Daughters.
8. Books in the Running Brooks—Sermons in Stones.
9. Farmers of Other Times. (30 minutes each.)

MURRAY, D. E., Catawissa, Pa.:

1. How to Make the Farm Orchard Pay. (40 minutes.)
2. Insect Pests of Orchard and Garden and How to Control Them. (50 minutes.)
3. Diseases of Plants, Trees and Fruit and Their Control. (30-40 minutes.)
4. Selecting, Planting and Care of the Young Orchard. (40 minutes.)

5. Pruning, Why and How. (40 minutes.)
6. Economic Aspect of Some Insects. (30 minutes.)
7. Marketing our Fruit. (30 minutes.)
8. Home and Fireside. (Evening). (40 minutes.)
9. The Farmer—Who and What he is. (Evening.) (35 minutes).
10. Nature's Story in Leaf and Flower. (Evening.) (35 minutes.)
11. The Great Importance of Spraying. (30 minutes.)

PATTON, WM. M., Mosgrove, Pa.:

1. The Planting and Care of the Farm Orchard.
2. Lime; When, How and For What to Use It.
3. The Possibilities of Alfalfa and How to Grow It.
4. Potato Growing for Profit.
5. Tillage vs. Fertilizer.
6. Clover Growing as a Soil Renovator.
7. Hog Feeding for Profit.
8. Marketing the Products of the Farm.
9. The Neat Farmer as His Influence. (30-60 minutes each.)
10. The High Cost of Living. (40 minutes.)

PEACHEY, J. H., Belleville, Pa.:

1. Alfalfa.
2. Butter Making on the Farm.
3. Horse Breeding for Farmers.
4. Corn Culture.
5. The Clover Crop and How We Grow It.
6. Soil Fertility.
7. Hogs for Profit.
8. The Home on the Farm. (Evening.)
9. Rural School Problem. (Evening.)
10. Goodby, Take Care of the Farm. (Evening.) (30-45 minutes each.)

PHILIPS, T. J., Atglen, Pa.:

1. Poultry Houses.
2. My Hens are Worth $3.00 Each—Are Yours?
3. Commercial Fertilizer; What to Use.
4. Stable Manure; Its Best Use.
5. Economical Dairy Feeding.
6. Lime; How and When to Use It.

PHILLIPS, E. L., New Bethlehem, Pa., R. F. D. No. 2.

1. Construction of Poultry Houses.
2. Beginning the Poultry Business.
3. How to Buy Commercial Fertilizer and How to Use It.
4. The Need of Lime in the Soil.
5. Good Roads; How to Get them. (25-30 minutes each.)

PHILLIPY, DR. W. T., Carlisle, Pa.:

1. Soils; Their Management and Fertility.
2. Corn Selection and Culture.
3. Alfalfa.
4. Potato Culture.
5. Poultry on the Farm.
6. Up-to-date Dairying.
7. Practical Fruit Growing. (35-45 minutes each.)
8. The Most Imperative Duties to Our People. (Evening Lecture.)
9. The Old Farm. (Evening Lecture.) (45 minutes.)

RUNK, J. A., Green Ridge, Md.:

1. Alfalfa.
2. Corn; Seed Selection, Growing and Improvement by Breeding.
3. Lime.
4. Soil Management.
5. Fruit Growing. (Apple in all its phases.)
6. Home Sanitation. (Evening.)
7. Improvement of Farm Home and Farm Conditions. (Evening.)

ROW, CHARLES A., Yardley, Pa.:

1. Growing and Selecting Seed Corn.
2. Home Mixing Fertilizers for Individual Crops.
3. Building Up the Dairy Herd.
4. Feeding the Dairy Cow.
5. Distribution and Eradication of Weeds.
6. Advantages of an Agricultural Education to the Average Farmer.
7. The Educational Value of Our County and State Fairs. (25-35 minutes each.)

SEEDS, ROBT. S., Birmingham, Pa.:

1. Value of Barnyard Manure. (30 minutes.)
2. Soil Improvement—The Keystone to Agriculture. (30 minutes.)
3. The Value of Fertility and Cheapest Way to Get it.
4. Education and the Farmer. (20 minutes.)
5. Benefits Derived from Farmers' Institutes. (20 minutes.)
6. What Constitutes A Country Home. (45 minutes.)
7. Mistakes of Life Exposed. (60 minutes.)

SMITH, MRS. EDITH ELLICOTT, Pennsdale, Pa.:

1. The Farm Mother. (25 minutes.)
2. The Farm Boy and Girl. (35 minutes.)
3. The County School. (40 minutes.)
4. Rural Life as We Should Make It. (40 minutes.)
5. Rural Hygiene. (30 minutes.)

STEPHENS, A. WOODWARD, Hoboken, Penna.:

1. Spraying Crops.
2. Growing the Orchard.
3. The Marketing Problem.
4. Practical Co-operation.

STEVENS, PROF. F. R., Geneva, N. Y.:

1. The Feeding of Animals.
2. Lime and Its Relation to the Rotation of Crops.
3. Alfalfa.
4. The Conservation of Soil Moisture.
5. Lime and Its Uses.
6. How Plants Feed and Grow.

STOUT, W. H., Pinegrove, Pa.:

1. Fruit Growing.
2. Marketing Farm Products.
3. Geological Observations.
4. Soil Characteristics.
5. Tenant Farming.
6. Maintaining Fertility.
7. Potato Growing.
8. Manures nad Fertilizers.
9. Nature's Laboratory.
10. Bee Keeping. (Illustrated with lantern slides.)

VAN NOY, LEON OTICE, Troy, Pa., R. F. D. No. 66.

1. How to Lay a Foundation for a Dairy Herd. (30 minutes.)
2. Feed and Care of the Dairy. (30 minutes.)
3. Making Butter on the Farm. (30 minutes.)
4. The Silo. (25 minutes.)
5. Swine as a Side Line with the Dairy. (20 minutes.)
6. Soil Fertility. (30 minutes.)
7. The Care of Milk. (20 minutes.)
8. Farming vs. Other Occupations. (60 minutes.) (Evening.)

WATTS, D. H., Kerrmoor, Pa.:

1. Starting an Apple Orchard. (20-30 minutes.)
2. Cultural Treatment of the Orchard. (20-30 minutes.)
3. Tree Diseases, Insect Pests, Spraying. (20-30 minutes.)
4. Peach Culture. (20-30 minutes.)
5. Building Up the Dairy Herd for Profit. (20-30 minutes.)
6. Economic Feeding of the Dairy Herd. (20-30 minutes.)
7. How to Make and Sell Gilt-Edge Butter. (20-30 minutes.)
8. Alfalfa; Its Value and Culture. (20-30 minutes.)
9. The Farmer and the Road Problem. (20-30 minutes.)
10. Farm Buildings and Blunders. (Evening.) (30-40 minutes.)
11. Our Education. Evening (30-40 minutes.)

WELD, R. J., Sugargrove, Pa.:

1. The Selection and Breeding of Dairy Herd. (30 minutes.)
2. Feeding the Dairy Herd. (30 minutes.)
3. Records Necessary to the Building of a Dairy Herd. (30 minutes.)
4. The Babcock Test on the Dairy Farm. (20 minutes.)
5. Butter Making on the Farm. (30 minutes.)
6. Crops for the Dairy Farm. (20 minutes.)

WITTMAN, W. THEO., Allentown, Pa.:

1. Poultry; Knowing More About It.
2. Poultry; Breeding.
3. Poultry; Housing.
4. Poultry; Feeding.
5. Poultry; Incubation and Rearing.
6. Poultry; Making Hens Lay in Winter.

Note: Where hall is equipped with lanterns, arrangements can be made for an evening lecture illustrated with slides.

WHITE, W. R., State College, Pa.:

1. Strawberry Culture. (20-30 minutes.)
2. Bush Fruits and How to Grow Them. (20-30 minutes.)
3. Pruning. (20-30 minutes.)
4. The Use of Concrete on the Farm. (30 minutes.)

LIST OF SPECIAL INSTITUTE INSTRUCTORS

Prof. Alva Agee, State College, Pa.
L. W. Arny, New Britain, Pa.
F. E. Bonsteel, Bear Lake, Pa.
Miss Arabella Carter, No. 1305 Arch St., Philadelphia, Pa.
Wm. T. Creasy, Catawissa, Pa.
Dr. J. D. Detrich, Chatham, N. Y.
I. A. Eschbach, Milton, Pa., R. F. D. No. 1.
Dr. Wm. Frear, State College, Pa.
Dr. Carl W. Gay, University of Pennsylvania, Philadelphia, Pa.
Geo. E. Hull, Transfer, Pa., R. F. D.
A. J. Kahler, Hughesville, Pa.
J. H. Ledy, Marion, Pa.
C. C. McCurdy, Hartstown, Pa.
M. S. McDowell, State College, Pa.
H. W. Northup, Dalton, Pa.
Prof. C. W. Larson, State College, Pa.
Prof. Wm. G. Owens, Lewisburg, Pa.
Chas. H. Rich, Woolrich, Pa.
Mrs. Sara Phillips Thomas, No. 3413 Race Street, Philadelphia, Pa.
Prof. R. L. Watts, State College, Pa.
S. Paul Woodman, Rushland, Pa.
Mrs. Sarah B. F. Zeigler, Duncannon, Pa.
Prof. H. E. Van Norman, State College, Pa.

DEPARTMENT LECTURERS

In so far as time and circumstances will permit, the officers of the Department of Agriculture are desirous of engaging in Institute work.

In order to prevent disappointment in the arrangement of programs, it is recommended that Institute Managers first consult the individual whose services they may wish to secure, before placing his name on the program.

Department lecturers come to these Institutes free of charge, except that they are to be taken from and to the railroad station at the expense of local manager. The topics which they will discuss can be procured by addressing the following officers of the Department of Agriculture:

HON. N. B. CRITCHFIELD, Secretary of Agriculture.
HON. A. L. MARTIN, Deputy Secretary and Director of Institutes.
JAMES FOUST, Dairy and Food Commissioner.
PROF. H. A. SURFACE, Economic Zoologist.
DR. C. J. MARSHALL, State Veterinarian.

BIOGRAPHICAL SKETCHES OF THE INSTITUTE LECTURERS

H. M. ANDERSON was born August 26th, 1874, on the farm which he has recently purchased from his father. He graduated from the York Collegiate Institute in 1894, since which time he has devoted practically all his time to agriculture. Has been for quite a number of years growing very profitable farm crops in what has until very recent years been called the York County Barrens. He is particularly interested in growing alfalfa, potatoes and corn and is doing experimental work with these crops; has an apple orchard of which he is very proud and is a close student of modern methods of increasing soil fertility.

L. W. ARNY after receiving his early education at public schools took a four year course at Pennsylvania State College specializing in Horticulture, during the summer of which he was employed by Hoopes Bros. & Thomas of West Chester, Pa., during Scale Inspection and Spraying, together with regular Nursery Work. After spending several years as Superintendent of a farm, having charge of fruit and market gardening, he took up professional spraying and pruning of orchards. He is now engaged in farming, having purchased a 40 acre farm on which he is specializing in the fruit business, also Secretary Horticultural Association of Bucks County.

M. S. BOND was born on a farm in Montour county, Pa., February 26, 1834; lived and worked on a farm until eighteen years old, then taught school seven years, then was employed as a freight and passenger conductor for nine years and traveled as lost freight and car tracer and purchasing agent for the Delaware, Lackawanna and Western Railroad Company for five years. Has been for over twenty-five years engaged in farming and market gardening; during a part of this time, engaged in breeding and raising blooded Jersey cattle and still keeps some of the best in the State; has made the raising of potatoes by the thousands of bushels a specialty for twenty-five years; has been and is now using more fertilizer to the acre than any man in his county, and is now making gardening a specialty.

CHARLES M. BARNITZ began the study of poultry culture twenty-five years ago and now conducts a model up-to-date poultry plant at Riverside, Pa., and is a recognized authority on poultry. His success and expert articles in the poultry press of the United States and Europe attracted the American Press Association, the greatest newspaper syndicate in the world. He accepted a place on their staff as editor and artist of their poultry feature, and his poultry writings are now read by millions of people throughout the United States. His modern and extensive plant at Riverside is a practical and profitable one, and interesting experiments with land and water fowl afford much valuable data for platform and press.

FRED W. CARD was born at Sylvania, Pa., in 1863. Attended the common schools and the Mansfield State Normal, from which he graduated in 1880, He taught three years in the public schools and took a business college course, after which he spent five years in gardening and small-fruit growing. In the fall of 1889 he entered Cornell University and completed the regular course in agriculture in 1892. He was then granted a fellowship and remained for graduate work the following year, receiving his master's degree in 1893. He was appointed assistant in horticulture at the Cornell University experiment station, but resigned in a short time to become associate professor of horticulture at the University of Nebraska, remaining in this position for five years. In 1898 he became professor of horticulture at the Rhode Island College of Agriculture and Mechanic Arts, and in 1901 professor of agriculture as well. This position he resigned in 1897 to engage in actual farming on the farm where he was born, which he had purchased while in Nebraska.

J. T. CAMPBELL was born in Springfield township, Fayette county, Pa., December 18, 1872; is the son of a prominent farmer; received his early education in the public schools of his native district; left the public schools with a more than average education, and at once took up the study of agriculture at home, while working on his father's farm; he studied carefully all leading books and journals of his day. Married in 1894, and took up gardening and poultry culture, and was successful from the start. When the Pennsylvania State College started it's correspondence courses in agriculture he took up the work and has since pursued same with diligence. Owns a large farm in Crawford county, upon which he has worked out many important agricultural problems. In poultry culture he has been exceptionally successful, having made it a subject of special study, together with soil physics. Keeps in close touch with the State Experiment Station and the National Department of Agriculture; has written some for various agricultural and poultry journals.

DR. MILTON E. CONARD was born in southern Chester county, in 1851, of an ancestry of successful agriculturists. He obtained his education in the public and high schools and Millersville State Normal School. He was for some years engaged in farming in his home locality; later taking the course in veterinary medicine at the University of Pennsylvania, graduating in 1891, in which institution he has for several years been lecturer of Dairy and Milk Inspection and Veterinary Obstetrics. Throughout his veterinary career he has been closely identified with dairy interests, practicing for some years in a dairy locality, and having for over ten years given his entire time as Inspector and Consulting Expert for a large number of the dairies furnishing milk to the City of Philadelphia from Pennsylvania, New Jersey, Maryland and Delaware.

M. N. CLARK was born near Export, Westmoreland county, Pa., July 16, 1848; received a good common school education, with several years at an academy and a full course at Duff's Commercial College, at Pittsburg; has always taken much delight in farming; is a close observer, and for many years has taken an active interest in agricultural affairs of his county; the cause of education has always found in him an earnest supporter; has been engaged in general farming from boyhood, except a few years spent in selling implements; was several seasons in the fruit growing regions of the south, and there gained much information in the use of commercial fertilizers and fruit growing; was a member of the State Board of Agriculture for ten years, and at present is looking after the interest of his farm.

ARABELLA CARTER, 1305 Arch St., Philadelphia, Pa., was born in Byberry, Philadelphia, on the farm which is yet her home. Educated at Byberry Friends' School and Swarthmore College. Interested in literary work she took a special course in journalism, securing her diploma in 1899, now being connected with the Philadelphia North American. For ten years she has been business manager of the Universal Peace Union. Though boarding in Philadelphia she is joint owner with her brother of the old homestead and actively interested in all changes and plans for improvement. Elected school director, she is the first woman in her locality to serve in this capacity.

CHARLES T. CORNMAN was born in Carlisle in the year 1863. His first venture in poultry breeding was White Crested Black Polish, and he bred them for some years but has not bred them for the last twenty years. Next he selected the Dorkings and bred them for several years with but little success. For many years he had a farm devoted to the breeding of White Plymouth Rocks, Pekin Ducks, White Duchess Pigeons and White Holland Turkeys. He has judged for six years at the largest poultry shows in the United States, and the additional honor of having a gold medal of the first class and a commemorative diploma conferred on him by the Universal Exposition for his work in connection with the greatest gathering of pure-bred poultry ever seen. Last winter delivered a series of lectures on poultry culture at the University of West Virginia and has been doing considerable educational work for the Farmers' Institutes, Grange fairs and meetings.

J. D. DETRICH'S knowledge of agriculture, as a science, dates from 1882, since which time he has been availing himself of all the bulletins, magazines and books relating to soil, crops, dairying, breeding, feeding and rearing of dairy animals. This, together with information furnished by the colleges and experiment stations, he has put into practice, and the result has been a satisfactory and profitable system of extensive farming.

W. M. C. DRAKE was born in Lawrence county, August 16, 1860. He was educated at the public schools and a Normal School at New Castle, Pa., passing a teachers' examination. He has spent all his life on the farm; was president of the Farmers' Alliance in Lawrence county one term. He has been for several years past in partnership with his brother, operating 600 acres of land, besides a market garden and an extensive orchard.

E. B. DORSETT was born on a farm in Richmond township, Tioga county, Pa., February 17, 1868. He received a common school education in the district where he lived, then attended the Mansfield State Normal School, from which he was graduated in 1896. Ten years were spent teaching during the winter months and farming during the summer. With the exception of six years spent in the Sheriff's Office at Wellsboro, he has always lived and worked on the farm. At present, he and his brother, S. C. Dorsett, own and operate a large farm in Mansfield township, making dairying a specialty. His work in the Grange as State Lecturer, has brought him in close touch with the farmers and farm operations throughout the State, and has given him a fund of knowledge that will be useful to him in his work as an institute worker.

I. A. ESCHBACH was born May 19, 1854, at Fallowfield, on the farm he now owns near Milton, Northumberland county, Pa. His education was in the common schools, with a little finishing up at Academy at McEwensville, Pa. Married at twenty-one and has always been engaged in farming, has always taken an active interest in local affairs of his section, serving as school director for thirteen successive years; served as President of Board of Directors of Milton Fair Association; is at present chairman of good roads movement in his own county and member of State Board of Agriculture in same. He has been a success as a farmer and stock raiser, breeding horses, cattle and sheep and hogs, together with raising all the general farm crops raised in his section. He has always taken active interest in Institute work in his county and is at home on all agricultural topics.

F. H. FASSET, Meshoppen, Pa., was born June 3, 1855, in Windham township, Wyoming county, Pa.; moved to Meshoppen township in 1869, to the farm where he now resides; was educated in the common schools and took a course in select schools in Meshoppen borough; has been actively engaged in the growing of tree fruits with marked success for the last twenty-five years; all up-to-date methods of orchard treatment, spraying and pruning have been in use; took up the business of growing small fruits for the market some 12 years ago and has met with fair success. Is President of Wyoming County Horticultural Society and in close touch with the fruit interests of this section.

JEAN KANE FOULKE was born in Wilmington, Delaware. Was educated at the Misses Hebb's School of this city. Removed to Philadelphia and became a private teacher for two years. Married George Rhyfedd Foulke in 1888 and removed to the mountains of North Carolina. After two or three years residence there they removed to the old Foulke homestead in Chester county, Pa. Here they became actively engaged in farming; joined the Grange and other agricultural associations. Since her husband's death in the autumn of 1901, Mrs. Foulke has continued the management of her own farm and in addition to that of other places in her vicinity.

WILLIAM FREAR was born in 1860, in Reading, Pa. He was educated in the public schools of that city and of Norristown, entered the preparatory and later the collegiate department of Bucknell University, graduating in 1881; pursued a post graduate course at Illinois, Wesleyan and Harvard Universities. Spent the growing season of the year during his childhood and youth at work upon a Pennsylvania farm; was made Assistant Chemist to the United States Department of Agriculture, 1883-5, and was engaged in sugar beet products and cereals In 1885 he was elected professor of agricultural chemistry in the Pennsylvania State College, and in 1887 was made vice-director and chemist to the Pennsylvania State College Experiment Station. In 1888 he was elected chemist to the Pennsylvania Board of Agriculture, and in 1895 chemist to the Pennsylvania Department of Agriculture. He was also president of the National Association of Agricultural Chemists.

J. H. FUNK, M. D., 6th generation from Bishop Henry Funk, who emigrated from Holland in 1719, was born in Lower Providence, Montgomery county, Pa., was brought up on his father's large dairy farm; attended public schools in the winter. In 1859-1860 attended Freeland Seminary (now Ursinus College); began the study of medicine in the spring of 1863 and received his diploma as Doctor of Medicine from the University of Pennsylvania in the spring of 1865; opened the first drug store in Boyertown and run it several years in connection with the practice of medicine. Served several years as the Burgess of Boyertown, also as Town Councilor and eight years as School Director. Always being in love with horticultural pursuits, he planted a large orchard in 1879. In the year 1896, he planted another apple and peach orchard and has continued planting until he has about fifty acres of the most profitable orchards in the State. Such a thing as "off-year" bearing is unknown in these orchards. Was several years Pennsylvania State Pomologist. He wrote Bulletin No. 152, "Fruits for Pennsylvania." He is now devoting his entire time to raising fruit on the best modern principles. In winter he has been for a number of years on the lecture force at Farmers' Institutes.

SHELDON W. FUNK was born in Boyertown, Berks county, Pa., May 7, 1888. He has a good high school education and also took a course at Perkiomen Seminary. From childhood he had been brought up among truck and fruit; five years of which were spent in Florida in the same vocation. For the last three years he has been in the greenhouse truck and fruit business with his father. Has had thirteen years' experience in the greenhouse, among the vegetable plants and the common flower.

H. M. GOODERHAM was born and reared on the farm where he now resides and cultivates in Cambria county. He was educated in common schools, academy at Carrolltown, Pa., and Ohio Normal University, Ada, Ohio. After teaching in common schools for several terms, he took up farming and experimental work, which he has followed successfully ever since. He has throughout his life been very much interested in education and uplifting of his brother farmer and his family. He has held several public offices of trust and at one time was a member of the State Board of Agriculture and at that time holding the distinction of being the youngest member on the Board in the State. He is at present treasurer of the Cambria County Horticultural Society.

PROFESSOR FRANK D. GARDNER, head of the Department of Agronomy of the Pennsylvania State College and Experiment Station was born and raised on a farm in Illinois and graduated from the College of Agriculture of the University of Illinois in 1891. For four years after graduation he was Assistant Agriculturist to his alma mater. He then served the National Department of Agriculture as Field and Laboratory Assistant, as Director of the Porto Rico Experiment Station and Chief of the Division of Soil Management. From the last named position he came to State College in his present capacity.

C. L. GOODLING was born in Loganville, York county, Pa. in 1885. He attended the public schools and York County Academy; entered the Pennsylvania State College 1903 and graduated 1907. After graduation was Assistant in the Dairy Husbandry Department, Pennsylvania State College, until December, 1909; since December, 1909, Superintendent of the farms of the Pennsylvania State College, State College, Pa.

JOEL A. HERR was born in Clinton county, Pa., and educated in the public schools and at Dickinson Seminary. He served in the Civil War and has been a student, teacher and farmer all his life. He lives on his farm and gives special attention to fruit culture and stock raising. He is a member of the State Board of Agriculture.

GEORGE E. HULL, the subject of this sketch, a number of years ago moved upon a worn-out farm without buildings in Mercer county. By industry, perserverance and intelligent effort he has succeeded in restoring it to the highest state of fertility; has placed thereon substantial and convenient farm buildings, and educated his children, without other income than derived from the farm. His silos, stock scales; farm implements and improved live stock are the admiration of all progressive farmers.

EDWARD K. HIBSHMAN was born and raised on a tobacco farm near Ephrata, Lancaster county, Pa. After completing the course in the Ephrata schools, he entered the Pennsylvania State College and graduated from that institution in 1909, with the degree of B. S. in Agriculture. Since that time he has been employed by the Pennsylvania State College as Field Assistant to the Department of Experimental Agricultural Chemistry, and has been in charge of the field work of the tobacco experiments. In the spring of 1910 he was appointed a special Collaborator in the tobacco investigations of the Bureau of Plant Industry, Washington, D. C.

A. J. KAHLER was born in Hughestown, Pa., in 1834; was educated in the public schools and afterwards taught school in his native county; has always lived upon a farm, has filled every local office in his township, was a member of the Legislature in 1891-1892; was president for six years of the County Agricultural Society; is a member of the State Board of Agriculture, and has been identified with most of the leading farm organizations of the State.

R. P. KESTER was born in Clearfield county, Pa., January 18, 1867. He now resides on the farm which his maternal great grandfather "took up" and partially cleared nearly 100 years ago. It was farmed for 80 years in the old way and the fertility was depleted until it was one of the worn-out farms. During the past few years Mr. Kester and his younger brother have been farming and dairying by modern methods, until now even five blades of grass grew where one grew before. Their leading business is dairying, although fruit, poultry and trucking receive attention. He was fifteen years a teacher and always a close student. And by learning from others and by experiments is making the homestead farm pay.

FRANK KLINE was born 1869 in Spring City, Chester county, Pa., of Pennsylvania born parents. Not being so fortunate as to be born and raised on a farm, having lived in a farming district he has been an observer of nature's works and while young took a great fancy to chickens and pigeons, which he has bred since twelve years of age. In 1895 he began to breed pure breed chickens both for utility and fancy. As a fancier he has exhibited in many of the largest shows in the United States, winning hundreds of regular and special prizes., At present his specialty is R. C. Rhode Island Reds, which have been handled with success for several years with the early hatching and rearing of chicks for both market and winter egg producers a special feature. His breeding yards are about his home in Spring City, where the public who are interested in poultry culture are welcome at all times.

PROFESSOR CARL W. LARSON was born in Mitchell county, Iowa, May 29, 1881. He was educated in the public schools of St. Anagar. In 1889 he graduated from the St. Anagar Business College, returning the same year to his father's farm. He entered the Ohio State College in 1901. The first two years he devoted to a study of General Science, and followed this with three years general agriculture, graduating in 1906. During his course, much time was devoted to dairy work, and in 1907 he completed a post-graduate course at the same institution, specializing in Dairying. While in college he was an assistant in the dairy department. After leaving college he worked in a large co-operative creamery in Minnesota. He also made cheese in a Wisconsin factory. Last year he was appointed by the Agricultural Department at Washington as inspector of butter for the United States Navy. He now holds the position of Assistant Professor of Dairy Husbandry at the Pennsylvania State College.

L. W. LIGHTY was born in York county, Pa., 1857; attended the public schools of his neighborhood; afterwards attended a select school in Adams county and then taught school for seven winters. During this time he attended the York County Academy one term and also attended the State Normal School at Millersville. He then kept store, but not liking the business he got out of it and started in the poultry business, keeping both market and fancy poultry, and engaged in bee keeping and the culture of small fruits. In 1893 he purchased the farm upon which he now lives. The land was worn out and the buildings quite dilapidated. He has improved this until it is now one of the best farms in his county. He has a large library of standard books, keeps a selected dairy of cows, and has all the modern improvements needed to equip a first-class farm.

D. K. MURRAY, A. M., Ph. D., was born 41 years ago at Liverpool, Pa, His education was received in the public schools of the State. He graduated from the Lock Haven Normal School, also from Taylor University with the degree A. B. His post graduate work was done at University of Chicago. Dr. Murray taught in the public schools of the State for eight years. For eight years he lived in the west and while there co-operated with Pres. Chalmers of the Agricultural College of South Dakota in a crusade of education among farmers, which has resulted in that State coming to the front not only in wheat but other cereals. Dr. Murray urged upon the farmer the necessity of soil conservation and the future of fruit culture. This he did while following his profession. He has always been actively interested in agricultural and horticultural pursuits. For nearly two years he has been working in the Department of Agriculture, Division of Zoology, giving all his time to this work. He has risen to the first rank as an intelligent and painstaking investigator. In his district his services are constantly in demand by grangers and farmers' alliances.

CLARENCE C. McCURDY was born in Crawford county, Pa., September 25, 1885. He received his early education in the high school of his home town. Successfully completing the correspondence courses in agriculture in the Pennsylvania State College, he then went to the Michigan Agricultural College, where he spent two years-in taking a special course in general agriculture and poultry husbandry. After finishing the course there he spent the first year in superintending a poultry and truck farm near Pittsburg. Returning home where he is now giving special attention to poultry as a profitable side line on the farm and showing his ability to improve the fertility of the soil and grow better crops and more of them.

MALCOLM H. McCALLUM is a Berks countian by birth, born, however, of Scotch parentage, and "dyed deep in the wool" in truck and fruit raising, his father, James McCallum, being the pioneer celery and fruit grower for the Reading markets. He is in the prime of life. He was educated in the common schools of Berks county, Pa., Butler University, Indianapolis, Indiana, and the University of Pennsylvania, Philadelphia, Pa. In 1904 he was chosen farm and garden superintendent of State Asylum, Wernersville, Pa., which position he now holds.

THOMAS I. MAIRS spent his early life upon a stock farm and graduated from the College of Agriculture of the University of Missouri in 1896. He took graduate work at the Michigan Agricultural College, the University of Illinois, and the University of Missouri. He was superintendent of field experiments at the University of Illinois in 1896-7, and Assistant in Agriculture at the University of Missouri from 1897 to 1901. Since he has been connected with the Pennsylvania State College. He is now Superintendent of Correspondence Courses and Professor of Agricultural Education. He has taught dairy and animal husbandry and has had charge of the experiment work along these lines.

M. S. McDOWELL was born in Mifflin county, Pa., attended the public schools, and Lewistown Academy; entered Pennsylvania State College in 1888, and was graduated in 1892; after graduation was connected with a fertilizer manufacturing establishment in Baltimore, and later came to the Chemical Department of the Experiment Station, with which he has been connected for some years.

PROF. FRANKLIN MENGES, Ph. D., was born forty-six years ago at Menges Mill, York county, Pa.; the first nineteen years of his life were spent on his father's farm with all the ardour that farming meant in those days; he then began a course of preparation for college at the Baugher Academy, Hanover, Pa., and entered and graduated from Pennsylvania College, Gettysburg, with the class of 1886; was immediately tendered and accepted the position of assistant professor of chemistry in his Alma Mater, which position he held until 1896, when he came to York and took the professorship of the sciences in the York High School, which position he now holds; received the degree of Ph. D. from his Alma Mater for special work in chemistry, mineralogy and physics. He has for years been a student of the "Experiment Station Record," and has continued an interest in practical agriculture and has lectured before Farmers' Institutes.

HENRY W. NORTHUP was born on a farm in Abington, once considered the banner agricultural township in Luzerne county; he was educated in the public schools and at Madison Academy. His chief business is that of farmer and dairyman; has been greatly benefited in this line of business for the last ten years by being associated with some of the best and most practical agriculturists in this and adjoining states in the institute work; has had some experience in fruit and market gardening and in disposition of these products in the city of Scranton, where an excellent market has been secured.

J. H. PEACHEY was born in Mifflin county, Pa., in 1852; his early life was spent on the farm which he now owns; received his early education in the public schools; taught school for a number of terms in Pennsylvania and Ohio; graduated in the scientific course from the Ohio Normal University of Ada in 1881. Continued teaching until driven from the school room because of ill health; he began farming in 1887. Following general farming for a few years, he began specializing in the dairy-making buttter for a special trade; and growing hogs. Disposing of his dairy a few years ago his attention is directed toward the growing of the peach and apple. He is deeply interested in the new agriculture, believing that clear thinking and right living will elevate the farmer.

DR. W. T. PHILLIPY was born on his father's farm in Antrim township, near Greencastle, Franklin county, Pa., February 25, 1863. Received his early education in the public schools and Zeyler's Academy at Greencastle, Pa., during summer season worked on the farm. March 28, 1884, received degree of M. D. from Jefferson Medical College, Philadelphia; came to Cumberland county, and practiced medicine successfully until about 1902, when he purchased a worn out farm near Carlisle, Pa., and proceeded to use modern and scientific methods and soon made it one of the best producing farms in that community; and since has bought another farm near and is now supervising the two farms and giving his time to scientific and practical farming in all its branches, including stock raising. He has filled a number of positions of trust and is a student of agriculture and keeps abreast of the best methods for successful tilling the soil.

THOMAS J. PHILIPS was born upon a farm in Chester county, Pa., December, 1846; attended public and private schools and graduated from Bucknell University in 1867; spent three years in manufacturing iron, and traveling, and then settled upon the farm where he still lives, giving special attention to dairying and raising dairy stock, but devoting much of the 200 acre farm to the production of mixed crops, suitable to that locality and market. That he had been a success is attested by the fact that he has been a director in a national bank for many years, a manager in one of the largest fire insurance companies in the State and of building and loan association; served two years in the State Legislature, as a representative of the farming interests; he has contributed acceptably from time to time of his experience to the agricultural press, and in every way has kept in the front among the most progressive of his locality, believing in higher education, attractive country homes, and that success is the result of individual effort and judgment.

E. L. PHILLIPS was born on his father's farm in Clarion county, Pa. Was educated in the common schools and a course in the High School at Reid Institute, Pa. Since then he has studied extensively in agriculture. Was married in 1885, after which he devoted his time to agriculture, owning and operating his 200 acre farm with profit to himself. Said farm is in Clarion county, Pa. He has devoted his farm chiefly to the production of fruits, live stock and grain suitable to that location and market. He has been an experimenter with various plant foods. His real estate holdings and commercial standing are a strong recommendation to himself and to the farm.

WARREN G. ROSS was born at Dunkard, Greene county, Pa., November 22, 1883. Early life spent on the farm; prepared for college at the West Virginia University Preparatory School, 1900-1904. Extended the course in agriculture at the Pennsylvania State College, February, 1905, graduated June, 1908. Was instructor in Agronomy at College Hawaii, Honolulu, 1908-1909. At present he is assistant in Agronomy at the Pennsylvania State College. Summer of 1910 engaged in field work for Bureau of Soils.

CHARLES A. ROW has lived on a farm all his life and done experimental work along various agricultural lines for the last six years. The two years previous to these were spent in the Ontario Agricultural College at Guelph, Canada from which institution he received a diploma. He is now in business with his father on a large farm near Yardley. They are making a specialty of raising pure bred cattle and improving corn and wheat by plant selection.

R. S. SEEDS was born in Huntingdon county, Pa., 1852; was educated in the public schools and at the Shade Gap Academy. He was raised upon a farm and traveled for eighteen years among the farmers selling agricultural implements. In 1892 he bought a farm that had been run down, which he has greatly improved.

A. W. STEPHENS was born in Westmoreland county, Pa., and received college training in this State, after which he went to Cornell University and was graduated from there in agriculture in 1900. For eight years he managed a successful co-operative store and while at Cornell made a special study of co-operation among fruit growers. He was orchard instructor for the Division of Zoology.

W. H. STOUT was born October 18, 1840, in Lower Nazareth township, Northampton county, Pa.; was educated in the common schools and engaged in various occupations, serving an apprenticeship at coopering and milling, at clerkship and traveling salesman; has lived on his present farm for the past twenty-eight years, and is engaged in general farming, trucking, fruit growing and bee-keeping; has acquired practical and scientific information by observation and study; speaks English and German.

CHARLES H. RICH. Born at Woolrich, Pa., December 31, 1862. Earlier life spent in Woolrich, employed in the woolen mills and on the farm. Educated in the common and high schools of the township, Pierce's School, Philadelphia, Pa., and Allegheny College at Meadville, Pa., followed surveying and lumbering for a number of years; also owner and operating a flouring mill in connection with several farms; a student of Chemistry and Physics as applied to agriculture. Is a member of the Farmers National Congress; Director of Continental Condensed Milk Co., Mill Hall, Pa., vice president of Mill Hall State Bank; Director in several utilities companies; lecturer in the grange; advocate of good schools, good roads and scientific farming. Has traveled much and taken an active part in horticulture and dairying—a model orchard is on his farm, has been a lecturer in Farmers Institutes in Pennsylvania and Ohio.

B. O. SEVERSON was born near Stoughton, Wisconsin, December 9, 1887. His parents are of Norwegian descent and are living at Stoughton, Wisconsin. His early life was that of a farm boy, receiving his early education at a district school, from which he graduated. Later, his education was continued at Stoughton High School. After graduating in the spring of 1906, he entered the University of Wisconsin, graduating there from the Agricultural course in 1910. During his University course, his specialty was along animal husbandry lines. During the past year, has been engaged as an instructor with the animal husbandry department at the Pennsylvania State College.

MISS SARA PHILLIPS THOMAS graduated from Friends Central School, Fifteenth and Race streets, Philadelphia, and since then has attended many lectures, some on Domestic Science and kindred subjects. Her especial interest in institute work at which she has been engaged for several years is in the establishment of Ladies' Sessions where the interests of the household can be discussed along practical lines. She was born on a farm in Chester Valley near Wayne, where she resided until recently and has been a practical housekeeper, giving much thought and considerable study to this department of the home. At present she is actively engaged in educational work.

LEON OTICE VAN NOY was born in Troy, Pa., 1876, on a dairy farm. At the age of six years his father started in the pure blood cattle. Was educated in the public school, Troy High School and took special work in general agriculture and dairy farming for three years at the Pennsylvania State College. He returned and went into partnership with his father in the dairy business and made a number of experiments in feeding for profit. In the fall of 1900, he was forced to quit his father's farm on account of ill health and traveled for a few years. Was in and through 34 states. During this time he worked at a number of occupations besides farming. Had a great opportunity to compare city life with country life. In 1906 he returned to hsi father's farm and took the management of it. Has a private creamery and at the present time is trying to solve the problem of the direct route from the producer to consumer.

PROF. H. E. VAN NORMAN is a native of Ontario, Canada, and is now 36 years of age. He grew up on farms in Nebraska, Illinois and Michigan, and early became acquainted with pure bred livestock through his father's association with a large importer and exhibitor of Holstein cattle and English draft horses, and by attendance at the old Chicago Fat Stock Show. Was appointed farm superintendent at Purdue University Agricultural Experiment Station, Lafayettte, Ind.; after four years in this work he was appointed professor of Dairy Husbandry, Pennsylvania State College of Agriculture, which position he now holds.

R. J. WELD was born in Warren county, Pennsylvania, October 27, 1868 upon the farm which he now owns and operates. He is of Scotch-American parentage. His education was secured at the common schools and at the Sugar Grove Seminary, also at a business college. He received his agricultural education and training at the Pennsylvania State College and Experiment Station. He is actively engaged in dairy farming and endeavoring through breeding, weeding and feeding to build up a large herd. He keeps accurate records of the production of his cows, and is building up his farm through systematic cultivation and fertilization.

W. THEO WITTMAN was born and raised on a farm in Lehigh county. As a small boy he was particularly interested in poultry and fruit growing and has always since retained a strong interest in both these branches of agriculture, constantly studying and working with both. He is now Poultry Judge with a National reputation, and his name is constantly appearing in the better class of poultry journals as a contributor to the poultry knowledge of the day. He has written several books on poultry keeping that are largely advertised and have commanded a big sale. As Superintendent of the Poultry Department of the Great Allentown Fair he has built up there one of the very finest and best displays of pure bred poultry to be seen anywhere in this country, greatly stimulating the interest in better poultry among farmers and others throughout eastern Pennsylvania and thereby enhancing the market value of their poultry and poultry products enormously.

D. H. WATTS was born near Kerrmoor, Pa., May 25, 1861; was raised on the farm of his father, Martin Watts, and educated in the public schools, which schooling was supplemented by a few months attendance at the Indiana State Normal School. He always has been interested in farmer's organizations and served two years as President of the Clearfield County Agricultural Society. He located upon his farm in 1866 and erected thereon modern buildings and established a dairy plant, where fine butter for a special trade is produced. The growing of fruits is also a specialty. On his farm known as "Orchard View Farm," there are 3,000 apple, peach, pear and plum trees, all his own selection and planting.

S. PAUL WOODMAN was born on a farm near Rushland, Bucks county, Pa., where he has always lived. He was educated at a common public school., took a three years course at the George School, near Newtown, Pa. Upon leaving the George School in 1898 he went to work on his father's farm for wages, where he worked until he took entire charge of the farm in 1905. At that time he was taking a correspondence course in agriculture at State College, Pa. He is engaged in general farming, fruit growing and market gardening.

MRS. SARAH BARTRUFF FRITZ ZEIGLER was born near Manheim, Lancaster county, Pa. Later moved with her parents to Perry county. Was educated in the public schools, New Bloomfield Academy and Juniata Valley Normal School. Previous to her marriage she taught school six winters. From 1890 to 1902 she manufactured and sold large quantities of jelly to the New York, Philadelphia and Boston markets. Was an active member of Prospect Grange and always held an office in the organization. She has always been deeply interested in agricultural pursuits and since her husband's death has conducted her farm of 140 acres in an able manner, bringing it up to a high standard of production and adding improvements, believing that pleasant surroundings tend to a better and happier home life.

Directions: County Chairmen and Local Institute Committees will please use the following outline for heading of program and follow as far as practicable the classification of subjects, embracing no more than two distinct topics for one session. The address of Welcome and Response can be omitted and a brief introductory address by County Chairman substituted when Local Committtee deem advisable.

SAMPLE PROGRAM—This Sample is Designed as an Aid to Institute Managers in Making up Their Programs.

PROGRAM

OF THE

....COUNTY

FARMERS' INSTITUTE

TO BE HELD UNDER THE AUSPICES OF

DEPARTMENT OF AGRICULTURE OF PENNSYLVANIA

DIVISION OF FARMERS' INSTITUTES

IN...HALL

....PA.

FRIDAY AND SATURDAY, DEC. 5 AND 6, 1912

EXERCISES PUBLIC AND FREE--EVERYBODY IS INVITED

ORDER OF BUSINESS

OPENING SESSION

Devoted to Soil Conditions

Wednesday Afternoon, December 3, 1:30.

Presiding Officer, ...

Opening Exercises.

Soil Fertility.

Soil Cultivation.

How to Conserve Soil Moisture.

(Question Box.)

Adjournment.

EDUCATIONAL SESSION

Wednesday Evening. December 3, 7:00.

Nature Study for County Schools.

Essential Qualifications to Successful Teaching.

Attractive Country School Grounds.

The Central Township School.

Adjournment.

DAIRY, STOCK AND POULTRY SESSION

Thursday Morning, December 4, 9:00.

(Question Box.)

Feed for the Dairy Cow.

The Silo As An Economic Investment in the Dairy.

Poultry Breeding and Feeding for Profit.

Adjournment.

Thursday Afternoon, December 4, 1:30.

(Question Box.)

Good Country Roads; How Obtained.

Sheep Husbandry.

Legumes for Feed and Fertility.

Adjournment.

LADIES' SESSION

In the Interest of Country Homes.

Thursday Evening, December 4, 7:00.

Music.

A Model Home.

What Books and Magazines Shall We Read; The Quality and Preparation of Food.

Heating, Lighting, Ventilating and Sanitary Arrangement of Country Homes.

Lawn and Garden.

Social Life in Rural Districts.

Adjournment.

SPECIAL NOTICE

The foregoing order will be followed as closely as possible, but other exercises will be introduced, if found desirable.

Although these institutes are designed and conducted for the education and advantage of farmers, yet all who are interested are invited to attend, and it is hoped that they will show their appreciation, not only by being present at the meetings, but also by taking part in the discussions.

ASK QUESTIONS

A question box will be kept upon the secretary's desk, and all are invited to place therein such questions as they may wish to have discussed during the session. At the proper time, designated by the meeting, these questions will be referred to some one for answer, or brought up for general discussion.

All granges, alliances, agricultural societies and kindred agricultural organizations are specially invited to attend.

For further information, and for programs, address,

Name, ...
Address, ...
Chairman of the Board of Institute Managers for —————County.

Local Committee.	Committee on Question.	County Board of Managers.
Wm. Stevens, Address, ...	William Stover, Address, ...	J. A. Walker, Address, ...
Mrs. Jane Weily, Address, ...	Miss Jane Miller, Address, ...	Wm. Cedars, Address, ...
Miss Emma Stone, Address, ...		John Williams, Address, ...

MEANS OF ACCESS

Trains on the B. C. R. R. arrive from the East at 8:30 A. M. and 5:19 P. M.; from the West at 9:40 A. M. and 9:38 P. M.

On the P. R. R. trains from the East arrive at 4:52 and 9:54 A. M. and 4:32 P. M.; from the West at 10:18 A. M. and 5:08 and 9:23 P. M.

Commonwealth of Pennsylvania

DEPARTMENT OF AGRICULTURE

BULLETIN No. 229

PROCEEDINGS OF THE
Farmers'
Annual Normal Institute
AND SPRING MEETING
State Board of Agriculture

COMPILED BY
A. L. MARTIN, *Director of Institutes*

HELD IN THE COURT HOUSE, TOWANDA, PA.
MAY 21 TO 24, 1912

HARRISBURG:
C. E. AUGHINBAUGH, PRINTER TO THE STATE OF PENNSYLVANIA.
1912

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PREFACE

Commonwealth of Pennsylvania,
Department of Agriculture,

Harrisburg, Pa., July 5, 1912.

There is perhaps no source of information upon subjects relating to either practical or scientific agriculture that is so easily available as the Farmers' Institute, and whatever adds to the efficiency of these institutes is of paramount importance. The hope of increasing their usefulness to the farmers of the State has led to the establishment of what is known as the Farmers' Normal Institute, in which all institute managers and lecturers of the State come together once a year for consultation and instruction.

In order that the instruction given at these institutes may be available to the greatest possible number, this Department publishes in bulletin form their proceedings, and so we send out the following bulletin, No. 229, containing the full proceedings of the Normal Institute held at Towanda, Pa., May 21-24, 1912, in the hope that it may prove helpful upon the many farms and in the many farmhouses to which it may come.

N. B. CRITCHFIELD,
Secretary of Agriculture.

LETTER OF TRANSMITTAL

Commonwealth of Pennsylvania,
Department of Agriculture,

Harrisburg, Pa., July 3, 1912.

Hon. N. B. Critchfield, Secretary of Agriculture:

Dear Sir: I have the honor to present herewith, bulletin of the Ninth Annual "Farmers' Normal Institute," which was held at Towanda, Pa., May 21 to 24, 1912.

Very respectfully,
A. L. MARTIN,
Director of Institutes.

MEMBERS

OF THE

PENNSYLVANIA STATE BOARD OF AGRICULTURE

FOR THE YEAR 1912

MEMBERS EX-OFFICIO

HON. JOHN K. TENER, Governor.
HON. HENRY HOUCK, Secretary of Internal Affairs.
DR. N. C. SCHAEFFER, Superintendent of Public Instruction.
DR. EDWIN ERLE SPARKS, President of the State College.
HON. A. E. SISSON, Auditor General.
HON. N. B. CRITCHFIELD, Secretary of Agriculture.

APPOINTED BY THE GOVERNOR

Gen. James A. Beaver, Bellefonte, Centre County, ...Term expires 1913
R. H. Thomas, Jr., Mechanicsburg, Cumberland County, ...Term expires 1915

APPOINTED BY THE STATE POULTRY ASSOCIATION

....

APPOINTED BY THE PENNSYLVANIA BRANCH OF THE AMERICAN POULTRY ASSOCIATION

W. Theo. Wittman, ...Allentown, ...1913

APPOINTED BY THE PENNSYLVANIA BEE-KEEPERS ASSOCIATION

William A. Selser, ...Philadelphia, ...1915

ELECTED BY COUNTY AGRICULTURAL SOCIETIES

			Term expires.
Adams,	A. I. Weidner,	Arendtsville,	1915
Allegheny,	A. J. Purdy,	Imperial, R. F. D. No. 1,	1915
Armstrong,	S. S. Blyholder,	Kelly Station,	1914
Beaver,	A. L. McKibben,	New Sheffield,	1914

			Term expires
Bedford,	Wm. F. Biddle,	Everett,	1915
Berks,	H. G. McGowan,	Geiger's Mills,	1913
Blair,	W. Frank Beck,	Altoona,	1914
Bradford,	F. D. Kerrick,	Towanda,	1913
Bucks,	B. Frank Wambold,	Sellersville,	1914
Butler,	W. H. Milliron,	Euclid,	1914
Cambria,	Jas. Westrick,	Patton, R. F. D. No. 2,	1913
Cameron,			
Carbon,			
Centre,	John A. Woodward,	Howard,	1915
Chester,	M. E. Conard,	Westgrove,	1915
Clarion,	J. H. Wilson,	Clarion,	1913
Clearfield,	Peter Gearhart,	Clearfield,	1913
Clinton,	J. A. Herr,	Millhall, R. F. D.,	1914
Columbia,			
Crawford,	J. S. Patton,	Hartstown,	1914
Cumberland,			
Dauphin,	Edward S. Keiper,	Middletown,	1914
Delaware,	E. J. Durnall,	Swarthmore,	1914
Elk,	John M. Wittman,	St. Mary's,	1915
Erie,			
Fayette,			
Forest,			
Franklin,	John P. Young,	Marion,	1914
Fulton,	J. L. Patterson,	McConnellsburg,	1913
Greene,	N. M. Biddle,	Carmichaels,	1913
Huntingdon,	Geo. G. Hutchison,	Warrior's Mark,	1915
Indiana,	S. C. George,	West Lebanon,	1913
Jefferson,	Peter B. Cowan,	Brookville,	1913
Juniata,	Matthew Rodgers,	Mexico,	1915
Lackawanna,	Horace Seamans,	Factoryville,	1913
Lancaster,	J. Aldus Herr,	Lancaster,	1914
Lawrence,	Sylvester Shaffer,	New Castle,	1913
Lebanon,	H. C. Snavely,	Cleona,	1913
Lehigh,	P. S. Fenstermaker,	Allentown,	1915
Luzerne,	J. E. Hildebrant,	Dallas R. F. D.,	1914
Lycoming,	A. J. Kahler,	Hughesville,	1915
McKean,	O. W. Abbey,	Turtle Point,	1913
Mercer,	W. C. Black,	Mercer,	1914
Mifflin,	M. M. Naginey,	Milroy,	1913
Monroe,	F. S. Brong,	Saylorsburg,	1913
Montgomery,	John H. Schultz,	Norristown,	1914
Montour,	J. Miles Derr,	Milton, R. F. D.,	1913
Northampton,	C. S. Messinger,	Tatamy,	1915
Northumberland,	I. A. Eschbach,	Milton, R. F. D.,	1914
*Perry,	A. T. Holman,	Millerstown,	1913
Philadelphia,	David Rust,	Philadelphia,	1913
Pike,	B. F. Killam,	Paupack,	1915
Potter,			
Schuylkill,	John Shoener,	New Ringgold,	1913
Snyder,			
Somerset,	John C. Weller,	Rockwood,	1914
Sullivan,	J. G. Cott,	Campbellsville,	1915
Susquehanna,	Frank A. Davies,	Montrose,	1913
Tioga,	Calvin H. DeWitt,	Mansfield,	1914
Union,	J. Newton Glover,	Vicksburg,	1914
Venango,			
Warren,	R. J. Weld,	Sugargrove,	1914
Washington,	D. S. Taylor,	Burgettstown,	1914
Wayne,	Warren E. Perham,	Pleasant Mount,	1914
Westmoreland,	M. P. Shoemaker,	Greensburg,	1913
Wyoming,	D. A. Knuppenburg,	Lake Carey,	1913
York,	G. F. Barnes,	Rossville,	1914

*Deceased.

OFFICERS

PRESIDENT

Hon. John K. Tener, Governor,	Harrisburg

VICE PRESIDENTS

Horace Seamans,	Factoryville
I. A. Eschbach,	Milton, R. F. D.
John H. Schultz,	Norristown

EXECUTIVE COMMITTEE

Dr. W. Frank Beck, Chairman,	Altoona
M. M. Naginey,	Milroy
P. S. Fenstermaker,	Allentown
*A. T. Holman,	Millerstown
Wm. F. Biddle,	Everett, R. F. D.
H. C. Snavely,	Cleona
Dr. M. E. Conard,	Westgrove
D. S. Taylor,	Burgettstown
W. C. Black,	Mercer
N. B. Critchfield, Secretary,	Harrisburg

ADVISORY COMMITTEE

Dr. M. E. Conard,	Westgrove
*A. T. Holman,	Millerstown
M. M. Naginey,	Milroy

COMMITTEE ON RESOLUTIONS

Col. J. A. Woodward, Chairman,	Howard
Matthew Rodgers,	Mexico
Joel A. Herr,	Millhall
M. P. Shoemaker,	Greensburg
P. S. Fenstermaker,	Allentown

CONSULTING SPECIALISTS

*Botanist,	Prof. W. A. Buckhout,	State College.
Pomologist,	Chester J. Tyson,	Floradale
Chemist,	Dr. Wm. Frear,	State College.
Veterinary Surgeon,	Dr. C. J. Marshall,	Harrisburg.
Sanitarian,	Dr. W. Frank Beck,	Altoona.
Microcopist and Hygienist,	Prof. J. W. Kellogg,	Harrisburg.
Entomologist,	Prof. Franklin Menges,	York.
Ornithologist,	Prof. H. A. Surface,	Harrisburg.
Meteorologist,	E. R. Demain,	Harrisburg.
Mineralogist,	Dr. Isaac A. Harvey,	Lock Haven.
Apiarist,	H. C. Klinger,	Liverpool.
Economic Geologist,	Baird Halberstadt,	Pottsville.
Agricultural Geologist,	W. H. Stout,	Pinegrove.
Forests and Forestry,	Robert Conklin,	Harrisburg.
Feeding Stuffs,	G. G. Hutchison,	Warrior's Mark.

*Deceased.

STANDING COMMITTEES

LEGISLATION

J. H. Wilson, Chairman,	Clarion
Peter Gearhart,	Clearfield
E. J. Durnall,	Swarthmore
S. S. Blyholder,	Kelly Station
Calvin H. DeWitt,	Mansfield

CEREALS AND CEREAL CROPS

J. Newton Glover, Chairman,	Vicksburg

ROADS AND ROAD LAWS

J. L. Patterson, Chairman,	McConnellsburg

FRUIT AND FRUIT CULTURE

Wm. F. Biddle, Chairman,	Everett, R. F. D.

DAIRY AND DAIRY PRODUCTS

R. J. Weld, Chairman,	Sugargrove

FERTILIZERS

J. Aldus Herr, Chairman,	Lancaster

WOOL AND TEXTILE FIBERS

D. S. Taylor, Chairman,	Burgettstown

LIVESTOCK

Dr. M. E. Conard, Chairman,	Westgrove

POULTRY

W. Theo. Wittman, Chairman,	Allentown

PROCEEDINGS OF THE SPRING MEETING OF THE PENNSYLVANIA STATE BOARD OF AGRICULTURE, HELD IN THE COURT HOUSE, TOWANDA, PA., May 21, 1912.

Towanda, Pa., Tuesday, May 21, 1912, 9.30 A. M.

Hon. N. B. Critchfield, Secretary of Agriculture, in the Chair.

The SECRETARY: The Board will please come to order. Is Mr. Seamans, the first Vice-President, in the room?

Mr. Seamans answered to his name.

The SECRETARY: Will you please take the Chair, Mr. Seamans.

Mr. Seamans took the Chair.

The CHAIRMAN: This is rather unexpected to me. I supposed, in my ignorance, that the Secretary took the Chair at the first meeting, and presided, and if you are thinking of hearing anything of any value from me at this time, I am afraid you will be disappointed. I don't know whether it is the same with you, or not, but with us, in our part of the State, the season is very backward, and the farmers have just fairly commenced their spring plowing. Very little seeding has been done, and scarcely any planting. I was called upon by the United States Government to make a report of the crops, weather, etc., the first day of May, and I think I reported that we had twenty-six days of rain in April, and so far, in May, the rainy weather has kept up until the present time.

Now, I believe the first thing on the program is roll-call. Will the Secretary please call the roll?

The Secretary called the roll, and to this and subsequent roll-calls the following members responded to their names:

Hon. N. B. Critchfield (Secretary and Ex-Officio Member); W. Theo. Wittman (Appointed by the Pennsylvania Branch of the American Poultry Association); A. I. Weidner, A. J. Purdy, S. S. Blyholder, W. F. Biddle, W. F. Beck, F. D. Kerrick, B. Frank Wambold, W. H. Milliron, Dr. M. E. Conard, J. A. Herr, A. P. Young, J. S. Patton, J. L. Patterson, N. M. Biddle, S. C. George, Peter B. Cowan, Matthew Rodgers, Horace Seamans, J. Aldus Herr, Sylvester Shaffer, P. S. Fenstermaker, J. E. Hildebrant, A. J. Kahler, W. C. Black, M. M. Naginey, F. S. Brong, John H. Schultz, C. S. Messinger, I. A. Eschbach, A. T. Holman, David Rust, B. F. Killam, John C. Weller, Frank A. Davies, Calvin H. DeWitt, J. Newton Glover, D. S. Taylor, Warren E. Perham, M. P. Shoemaker, D. A. Knuppenburg, and G. F. Barnes.

The SECRETARY: There is a quorum present, Mr. Chairman.

The CHAIRMAN: The next item is the reading of the minutes of the previous meeting.

MR KAHLER: I move that we dispense with the reading of the minutes.

This motion was properly seconded, and duly carried in the regular way.

The CHAIRMAN: The next is the appointment of the Committee on Credentials. I have not yet appointed this Committee; I should have it ready. How many is it the usual practice to appoint on this Committee, Mr. Secretary?

The SECRETARY: Five, usually.

The CHAIRMAN: May I have a moment or two to prepare this Committee?

The SECRETARY: Oh, certainly; we have plenty of time, Mr. Chairman.

The CHAIRMAN: I will appoint the following Committee on Credentials: Messrs. Joel A. Herr, A. P. Young, Frank A. Davies, A. I. Weidner and W. F. Biddle.

Any one having Credentials will please hand them to this Committee, who will act on them.

The SECRETARY: The next item will be the report of the Committee on Credentials. I think, therefore, it will be well to take a recess for a few minutes, which will give us a chance to visit among each other, or, if the Board chooses, to discuss any question we wish to take up.

MR. JOEL A. HERR: If there are any persons here having any credentials, please hand them in. There have none been sent in, so far.

I would like to ask the Secretary whether he knows anything of the withdrawal or resignation of Br. Cott? We have a copy of the credentials of Mr. Warburton from his county.

The SECRETARY: Not to my knowledge. I would prefer to leave it go over until the next meeting of the Board.

MR. JOEL A. HERR: The commission of Mr. E. R. Warburton bears the seal of the Society as its representative for three years commencing January, 1912. Now, we have another man elected from that county as a member of the Board, commencing January, 1912, and until he resigns, I do not see how we can act upon this credential.

The SECRETARY: I had intended to put with this credential a letter which is signed by the Secretary of the Sullivan County Agricultural Society, saying that Mr. Warburton had been appointed to take the place of Mr. Cott, who has never done anything, but I don't see that we can do anything unless the gentleman is here.

MR. JOEL A. HERR: I was at the Sullivan County Institutes last year, but Mr. Cott did not make his appearance. There was a general desire on the part of the people that Mr. Warburton represent them, although Mr. Cott had been elected.

DIRECTOR MARTIN: I recall some correspondence on the subject of making inquiry as to the eligibility of Mr. Warburton. The letter stated that Mr. Cott was inactive and had refused to do anything. I replied that Mr. Warburton was perfectly satisfactory—that is, so far as Institute work was concerned.

MR. JOEL A. HERR: I know a number of cases where the member of the Board does not conduct the Institutes. If there are no other credentials to act upon, I see no reason for calling the Committe together. So long as Mr. Cott has not resigned, we cannot act upon this credential. It is the personal opinion of a great many people, as well as my own, that Mr. Cott is inactive, but until he resigns, we can do nothing.

A Member: I move that this be laid on the table and referred back to the Society for the resignation of that member of the Board, and then this credential acted upon at the next meeting.

The SECRETARY: That motion, I think, is not quite as the gentleman wants to make it. I believe it would be better to authorize the Secretary to correspond with the Society and have the place declared vacant. The power that appoints has the power to declare the place vacant. That is one of the questions that is being very generally discussed; that is the recall.

MR. JOEL A. HERR: As a substitute for that motion, I move that the Secretary be authorized to correspond with the Sullivan County Agricultural Society with regard to this credential, and report at the next meeting of the Board.

This motion was properly seconded and duly carried in the regular way.

MR. JOEL A. HERR: Any other credentials to be handed in? I will call a meeting of the Committee if there are.

The SECRETARY: I think there is nothing further under this head.

MR. FENSTERMAKER: I think this Committee should come together, whether there are any credentials to be acted on or not. Take this thing of the expiration of the terms of the members of the Board. According to the printed list on the program, the term of R. I. Young expired in 1911; that of Mr. Nevius in 1910; Lehigh in 1912. That is not correct; my term expires in 1915. The Credential Committee should look into this and have these things straightened out.

MR. JOEL A. HERR: The only person who is authorized to correct that is the Secretary himself.

MR. BLYHOLDER: I want to ask a question: Can a man be a member of the Board unless he attends the meetings?

MR. FENSTERMAKER: That is a very practical question. Some men never show their faces from year to year.

MR. JOEL A. HERR: As long as a man is elected for three years, he is a member of the Board for that length of time. Take the member from Greene county; he has served one term after another, and has not been present at all. That is not right; but he is a member of the Board until his term expires. It might be well to go over this list, as suggested by Mr. Fenstermaker, and go into the matter of the expiration of the terms. Take the list of those appointed by the Governor; one expires in 1911, one in 1913, and one in 1915. They are appointed for three years, not for one or two years, as this list has it. Now if this list were called, with the expirations, the Secretary could make a note of it, and see whether it is correct or not.

MR. BLYHOLDER: If the ruling of the Chairman of the Committee is correct, that a man is a member of the Board if he has been elected by the Society of his county, whether he serves or not, it seems to me that the time has come when this Board should make a new rule, that no man, whether elected by his Society or appointed by the Governor can become a member of the Board unless he expresses a willingness to attend its meetings, unless prevented by sickness.

MR. TAYLOR: Mr. Chairman, an illustration of the point in question is the late Charles H. Mullen of Cumberland county, who had been a member of the Board for over thirty years, and I don't think he attended half a dozen meetings. When he was first elected, he came occasionally, but for the last ten or twelve years he was never there. If we can correct this, it would be well to do so. We want only active men on this Board. Some of them are elected year after year by their Societies, for a lifetime, and feel no obligation to do anything.

MR. WELLER: Is a person supposed to be a member of the Board until his successor is elected?

The SECRETARY: The Act of Assembly, Mr. Chairman, says that the Agricultural Society of each county shall have the right to appoint a member to represent the county, and that the term shall be three years. There is nothing in the Act that will continue a man until his successor is appointed. Of course, that is the case with some public officials.

I don't know what was the purpose of these names appearing on the program, Mr. Martin, can you give me any light on the subject?

DIRECTOR MARTIN: It is simply a custom that has been followed for the last sixteen years. The idea of having the name put there was to show the member last elected and the expiration of his term, so that the attention of the Board would be called to the fact. We think it better to do this, rather than to leave the county blank, leaving the matter open to the discussion of the Board. The Chief Clerk, as you know, makes out this list, and we placed this list as made out, upon this program. I am conversant with the thought in the Chief Clerk's mind in not desiring to drop the county on account of the negligence of the Agricultural Society, or the oversight of the Governor, in not making an appointment. The Chief Clerk does not feel like taking any responsibility in the matter.

The SECRETARY: That makes a very satisfactory explanation, and it brings it right up to the Board to say what should be done. If you want to bring up before to the Board what is the standing of the members of your Board, or what is the standing of the last member elected from any county, that is all right, but the Secretary has no authority to decide this matter.

Mr. JOEL A. HERR: Would it not be just as well to leave it blank?

DIRECTOR MARTIN: We think the responsibility of the membership rests with this Board, and not with the clerk—entirely so. He takes the list as he finds it, and if the names are not dropped by authority of the Board, he puts them in.

MR. BLYHOLDER: I move that the Secretary be requested to suspend all these non-active members, and that a committee of three be appointed to go over the matter with him and report at the next meeting.

This motion was properly seconded.

MR. JOEL A. HERR: The question arises in my mind whether, if an agricultural society sends in a name, and the Board elects him a member, you can turn him out before the end of the three years for non-attendance, or only for ill conduct.

The SECRETARY: In answer to Mr. Herr, the Board does not have the power, but the Society that sends him has that power. As I understand it, these names have been allowed to stand here to call the attention of the Board to the fact of how long these places have been vacant.

MR. FENSTERMAKER: Mr. Chairman, it seems to me that this Board should have the power to declare a vacancy where a man does not present himself at the meetings. Why, you might just as well have a lot of posts or inanimate objects. They would do just as much good.

The SECRETARY: It is not that we are opposed to doing it; simply we have not the power. That belongs to the Society that sends them.

MR. BARNES: I agree with Mr. Fenstermaker in this matter. If the Board has the power to seat a member, it should also have the power to declare a vacancy. I know of one county that has never had a representative here in the seven years I have been a member of the Board, and it has a good Agricultural Society. I would suggest that this committee be appointed to confer with these Societies and see what can be done.

The SECRETARY: I think the point in the minds of these gentlemen is that the purpose of these Societies is to recommend these men for membership, and all the Committee on Credentials is to do is to see that their credentials are in proper form. They are simply the evidence that these men have been elected by their Societies at home. We have no power to declare any of these places vacant. We can only call the attention of the Societies to the fact that such men do not attend, and are inactive, but we cannot declare the place vacant.

MR. HOLMAN: I think much of this may be caused by the dilatory secretary of these different Societies, and I think this committee should stir them up and have them elect men who will do their part.

MR. BARNES: In my remarks I referred to some of the cases where they have not elected a member for several years. I know that Cumberland has not elected a member for the last five or six years.

MR. JOEL A. HERR: I take issue with the Secretary on one thing. The Board has control over its own membership. The members are always elected after they are appointed by their Societies. In one instance, at least, they refused to seat a man after he had been appointed by the Society of his county.

The SECRETARY: That was because his credentials were not in proper form.

MR. JOEL A. HERR: No; it was because of the man himself.

MR. W. F. BIDDLE: Are the members seated or elected by the Board?

MR. JOEL A. HERR: Elected.

Mr. BLYHOLDER: For that reason let us have this committee, and if necessary suggest an amendment to this Act, so that the Board may have some authority over its members.

The SECRETARY: I would like to get a whack at my friend right here. I would like to ask him whether, if a man is elected to the General Assembly and gets his credentials, he does not become a member without the General Assembly electing him? It seems to me to be almost an absurd proposition. They may have the power to depose him, but they have no power to elect him.

MR. JOEL A. HERR: There is a possibility that by legal proceedings he could claim his seat, but the Board has the power of its membership, and has the right, in my judgment, to elect a member after he has been appointed by the different Societies, and it has been my experience in the last thirty-five years that we have always elected them.

MR. BLYHOLDER: I want to say that on several occasions I made a motion that they be seated, not elected.

MR. FENSTERMAKER: I remember having made the motion that we admit the members.

MR. BLYHOLDER: Well, what does that mean? What is the difference between tweedle-dum and tweedle-dee?

MR. WELLER: How about the county that does not have a county organization?

The SECRETARY: They are not entitled to a representative according to the Act of Assembly. It is intended to advance the interest of agriculture in the county.

MR. A. P. YOUNG: There seems to be a lack of interest on the part of the Societies, and, sometimes, also on the part of the Committee on Credentials. Take my own case. I came here without credentials. I was elected last January, but I didn't have the certificate with me when I went to the meeting; I forgot to take it with me. When I got back, I mailed it to the Secretary of the Society, expecting him to send it to the Secretary of this Board; yesterday he told me he had neglected to do so because he had neglected to get the signature of the President. Now, I have been elected, or I will be, as soon as my certificate gets here, but I have nothing to show for it, and yet I have been accepted as a member.

The SECRETARY: That is because the Board has full confidence in your statement that you have been elected.

DR. BECK: I think where a man is elected and does not come, it would be well to take up the matter with the Society and tell them that this man is not fulfilling his duty in the proper manner, and then if he is elected again, we can refuse to seat him.

SECRETARY CRITCHFIELD: I would say, in answer to the gentleman from Blair, that in every instance the Secretary has sent a notice to the Society of the expiration of the term of their representative. That is all we can do. We try to keep a correct roster. Mr. Martin has charge of it, and he is always faithful. And that is all we can do.

MR. MESSINGER: I thoroughly agree with Dr. Beck. I think where a man is elected to represent his people, and he does not do it, I don't believe he is any good to this organization, and I think this gentleman has the correct idea of what to do with him. If a man does not take interest enough in the matter to attend the meetings, he is not entitled to a seat in the Board.

The CHAIRMAN: This matter has been threshed out at considerable length. Are you ready for the question?

The question having been put, the motion was found to have been carried.

The CHAIRMAN: This Committee will be appointed later in the day. We will now proceed to take up the next item on the program, which is "Unfinished Business."

The SECRETARY: The minutes were not read, and the only item of unfinished business that I can recall is the report of this special Committee on Legislation that was appointed at the last meeting, and if my memory serves me correctly, Mr. J. Aldus Herr is chairman of that Committee. This Committee as appointed to inquire into and report on the subject of Agricultural Legislation in Pennsylvania, and take up the question of appropriations with our next Legislature.

MR. WELLER: I don't see why it was necessary to appoint that Committee; we have a regular Committee on Legislation.

MR. TAYLOR: It appears to me that if there are any members of this Committee present they should report.

The SECRETARY: It was not appointed to take the place of the Standing Committee, but to confer with it and to act in conjunction with it. I will read the names of the Committee: Messrs. J. Aldus Herr, W. E. Perham, M. E. Conard, P. S. Fenstermaker and I. A. Eschbach.

MR. FENSTERMAKER: That is a mistake. I am not a member of this Committee. At least, if I am, I have never been informed of it, or notified of any meeting.

MR. GEORGE: I presume that is a mistake in subsituting Mr. Fenstermaker's name for mine. I am a member of that Committee. We met, and Mr. Martin gave us such instructions as he thought fit, but there was nothing definitely done. Mr. Martin said he would call us together again between that time and this meeting, but we have not met since, and I don't know that there is anything special to report.

DIRECTOR MARTIN: With your permission, Mr. Chairman, I would like to say a few words on this subject. There has been quite a lack of unity among the different agricultural organizations, and the best way to secure legislation and appropriations, is to secure cooperation of all the interests in agriculture, and this Committee, as I understand it, was appointed for the purpose of formulating such methods as will meet with the approval of all the interests in agriculture. And if it were proper at this time, I would suggest that since the larger part of this Committee is not here, but will be, later the Board defer action upon this report until a future session when the delegates can reorganize and receive the report. I have no doubt that the Institute session which follows this meeting will be glad to allow the Board the time to hold a short session to receive the report, and will be glad to co-operate with any legislation that may be suggested. I merely make this suggestion. If the Board deems proper to reorganize during any of the Institute sessions, we shall be glad to give them the time.

MR. GEORGE: I think the name of Mr. Shoemaker was overlooked as a member of that Committee; if I am correct, he was appointed on that Committee because he is a member of the Assembly, and he was instructed to take such notes as came under his notice. Mr. Herr was made President, and Mr. Shoemaker Secretary.

The SECRETARY: I would like to ask if your recollection of the other gentlemen as named is that they are correct?

MR. GEORGE: Yes, sir.

The SECRETARY: This Committee was not appointed immediately following the adoption of the motion, but a slip was handed me giving the names of the gentlemen appointed by the Chair to serve on it. I am not willing to admit I was mistaken, and may be able to locate the slip of paper.

MR. TAYLOR: I move that this Committee be continued since it has not yet made its report.

This motion was properly seconded, and duly carried in the regular way.

MR. WELLER: Why this Committee when there is a regular Legislative Committee? Are they to report only to this body, or to the Legislature? The Legislature does not like to have so many bodies to deal with.

The SECRETARY: The resolution was that a committee of seven be appointed to act with the Department of Agriculture and inquire into the best methods to be used in securing legislation and appropriations to further the cause of agriculture in the State. It is possible that conditions that prevailed at our State Capital last winter had something to do with it. I was very busy at the time, but I am sure you remember that the whole Board of Agriculture was called to Harrisburg to co-operate with the Department of Agriculture to secure the appropriations that were secured, and it required some rather strenuous efforts to get what we did. Now, as I understand it, this Legislative Committee is not appointed to devise legislation, but to aid in securing legislation that has been devised.

MR. JOEL A. HERR: Also to devise, if I am correct.

The SECRETARY: I think if you will look the matter up, you will see that it is supposed to assist in procuring legislation that has been already devised.

MR. KAHLER: I have served on that Committee for many years, and it was always so understood. In regard to the remarks of the gentleman from Somerset, Mr. Weller, I would like to say that when this Committee was appointed, there was no desire to interfere with the regular Standing Committee of the Board. It was simply appointed to act in connection with the regular Committee, so that when any questions arise we can act as one man.

MR. JOEL A. HERR: I think the best thing to do is to let this Committee report, and its report will be the report of the Legislative Committee. I make a motion to that effect.

The CHAIRMAN: There is a motion already before the house, that the report of this Committee be accepted, and the Committee continued to make a further report at this session.

MR. GEORGE: I understand that this session is to close in about an hour, and I do not see how we can make a further report. There is no one here.

MR. BLYHOLDER: That is very easily remedied; it is called together by the Vice-President, and I move you, sir, that when we adjourn this morning, we do so to meet at the call of the Vice-President.

MR. RODGERS: I second that motion.

This motion was duly carried in the regular way.

MR. JOEL A. HERR: It occurs to me that in many of the societies of the State, they don't really appreciate what the Board of Agriculture is for. You know the Act of Assembly creating this Board dates away back to 1874-76. Since then the Department of Agriculture has been formed, and some of its duties defined in the Act creating the Board. But I think it would be well to have the Secretary of Agriculture prepare a circular and mail it to each Agricultural Society of the State and then they would understand just what is expected of them. A member of the Board who does not take any interest in Institute work, and does not work for the betterment of agriculture in his county has no right to be considered a member and should not be allowed to remain such.

MR. W. F. BIDDLE: If the Secretaries of the Agricultural Societies throughout the State are like some of those I know, it would do them good.

MR. BLYHOLDER: I know the public is sadly in need of information on this subject, and I have asked my Institute workers to take a few minutes to explain to the audience the duties of the chairman and of the audience, and it comes with a great deal more force from the Institute speaker than from the chairman himself. In my county, a great many people believe that the county chairman is well paid. I believe he is, in information.

MR. JOEL A. HERR: I make my suggestion as a motion, that the Secretary prepare such circular as I have suggested and mail it to each Agricultural Society in the State.

This motion was properly seconded.

The SECRETARY: I suppose the Secretary will have to use a little of his good judgment in the matter, as the Act is very vague on that subject.

MR. BLYHOLDER: I am afraid that perhaps it will entail a lot of extra work on the Secretary, and perhaps also mean a great deal of expense.

The SECRETARY: The expense will not be much outside of some gas light which it will be necessary for the Secretary to consume when he sits up at night doing this work; but if it is the wish of the Board, I am willing to take upon myself the extra work.

MR. SCHULTZ: I think that is a very good idea, because I know members in my county who think the county chairman is well paid; some of them think I would not have taken it if it did not pay me, and I believe that a good many of my fellow members run up against the same thing.

MR. BRONG: I think the Secretary should notify the Society that a member of the Board elected by them who does not take an active part, will be dropped.

MR. JOEL A. HERR: Le me give you a concrete instance of this: You remember a few years age the Board received two sets of credentials from Centre county, one in the name of Col. Reynolds and the other Col. Woodward. There were two Societies in that county, and the older one had elected Col. Woodward. The other, and newer one, had elected Col. Reynolds. Three out of five of the Committee on Credentials decided that Col. Reynolds' credentials were correct; the other two held they were not, so it was decided to carry it over until the next meeting. Correspondence was entered into with Col. Reynolds, and he was informed what he was expected to do. When he learned this, he promptly refused to serve, and Col. Woodward was elected by the same Society. Now, there is a case where a man, when informed of his duties, refused to serve, and many others would no doubt do the same, if they knew before they were elected what was expected of them.

The CHAIRMAN: Are you ready for the question?

The result of the poll showed that this motion was duly carried in the regular way.

MR. TAYLOR: As there is nothing before the house, I wish to make a statement of the condition of the Washington County Agricultural Societies. We have three Agricultural Societies, and, as I understand it, only one receives the one hundred dollar county appropriation, and recognition from the State Board. I represent a Society that has been in existence for fifty-seven years, and has held a fair every year. Since that time there have been three others organized which have since died. We have also had two or three others. We have always received the State appropriation. Last year a new organization made application, and we also made application for that hundred dollars in connection with the thousand dollars. Having three Agricultural Societies, our County Commissioners decided to divide the appropriation between Burgettstown, Washington and West Alexandria. We received the State appropriation of one thousand dollars, and are in existence the longest, and so have the right to representation.

The SECRETARY: The Act of Assembly, as I remember it, provides that a county to be eligible to representation on the Board was also to received the appropriation of one hundred dollars. Now the decision of that question does not depend entirely upon the Commissioners. I don't see why the State Board should not have some authority.

MR. TAYLOR: That is what I brought it up for.

The SECRETARY: I am not here to interpret the law. That is the part of the Courts. I am giving you my own view. I think your county is acting wisely, if they have three organizations, to divide the money between them. It might be well also to have the work and the honor of representation divided between them.

MR. DAVIES: There has been a recent decision in regard to the hundred dollar appropriation—that is, it is to go to the organization that has expended the greatest amount for the dissemination of agricultural knowledge. The thousand dollars that is paid to the county is paid in proportion to the amount expended in premiums. The Societies make their report to the Commissioners before the 15th of November, and he makes his report to the State.

MR. BLYHOLDER: For what?

MR. DAVIES: Agricultural experiments.

MR. TAYLOR: That is, the President must make affidavit that there has been expended by the Agricultural Society in one year since the last report, so much on horses, so much on cows, sheep and implements, &c. If it exceeds a thousand dollars, they are entitled to a thousand dollars, but if it only amounts to five hundred dollars, they will only receive five hundred.

MR. MESSINGER: As President of our organization, I would say that we must make an itemized statement—John Smith, bushel of wheat, and so on. Whatever goes out of the county is struck off. We have two other organizations in our county, and they were getting quite an advantage over us, so I went to the Commissioners' office, and asked to look over the list, and found that 40% went out of the county, so we came out right.

The SECRETARY: You gain in premiums?

MR. MESSINGER: Yes, sir; it is always well to look into these things. Some people are always a little bit smarter than others.

The SECRETARY: That is a pretty good trick, but I do not think it is quite in accordance with the Act of Assembly. I think the Act of Assembly provides that the money shall be raised from the treasury of the Society. If you have this money in your treasury, you can go to the Commissioners; I do not think it makes any provisions regarding the premiums going out of the county. Suppose the fellow from the other county has better horses, or better swine or cows than you have; unless he stands a chance of winning a premium, there will be no incentive to him to exhibit them in your county, and you will lose the benefit of what information you could have obtained from the comparison.

MR. MESSINGER: That man gets a first-class premium, but we are only entitled to our money from the Commissioners for premiums paid in the county. We paid out a great deal outside of the county, and in the county we expended over $1,500.

MR. FENSTERMAKER: I think Brother Taylor refers more to the condition of things in his own county than anything else. Now, no county can support three fairs. Why not get together and have one big fair, like the great Allentown Fair?

MR. BLYHOLDER: It is like politics; we cannot get together.

The SECRETARY: You get your appropriation for the Allentown Fair?

MR. FENSTERMAKER: Oh, yes; but we spend over $25,000 in premiums.

MR. TAYLOR: Our county is large. I do not altogether agree with the gentleman in thinking that we could do more good by having one fair for the entire county. It may be all right in his county, but we believe that by having these several fairs in different parts of the county, it brings the stock breeders into competition with each other and stimulates the breeding of better stock and the raising of better corn. The point I wanted to bring out is, whether it is in the province of the Commissioners to say which of the three societies shall have the hundred dollars. We pay premiums out of our treasury, and then we have the county appropriation and the State appropriation to help us.

A Member: I think the gentleman is wrong, because the Act of Assembly provides that the oldest organization in the county shall get the money.

MR. MESSINGER: Now, in the Northampton County Agricultural Society we hold fairs without paying any dividends; whereas, our other fairs are corporations and run for their own profit. We hold a county fair, and we are entitled to our thousand dollars so long as our institution exists, no matter how many others may spring up.

MR. TAYLOR: In answer to the last speaker: We have a corporate body, and it is one of our organizations. In the other two, they receive their members by subscription, and they get a dividend, if there is any. The Union Agricultural Society of Burgettstown has no profit. If the Secretary and your honorable selves would come to Burgettstown and buy a membership ticket for a dollar, it would admit yourself, your wife and your children under twelve years old. You would have the right to come to our meetings and there vote for the officers. Any money in our treasury is paid out in premiums and our premium list grows every year. There are three paid officers—the Treasurer, Secretary and Assistant Secretary. The other officers have their expenses paid while in the service of the fair. The rest goes for the benefit of the farming community of Washington county. We think we have the ideal way to conduct a fair. No one of the three is a county organization.

DIRECTOR MARTIN: I feel almost tempted to add a little to this discussion myself. I would like to know, for our information, how many persons present represent an agricultural society? Hold up your hands. That is good. It has been a part of my work for the past twelve years to collect information relative to agricultural subjects. I ask certain questions relative to the conduct of these fairs, and report them in bulletin form, as you all know. But what I want to say is this: You gentlemen are in close touch with these Societies, and I want you to go to the officers and find out what special measures have been adopted to emphasize agriculture in reference to expert judges and expert managers—men expert in poultry, in the animal line and in vegetables. Place such men in charge, and then get good judges—good expert men who can stand up and tell the people the reason for the conformation of the body to a certain type, and the desirabilty of it. I take this opportunity to emphasize this point.

MRS. SMITH: Gentlemen, I want to say something on this very subject. I have made a very strong effort to wake up my county on this very subject. We have a very able President, and he is very anxious to give the county expert judges, but even so, it is very often a mistake to give premiums to people who exhibit stock which is not up to standard. I suppose it is done to prevent ill feeling, and possibly to encourage them to exhibit their best, but it has the effect of discouraging the owners of pure bred stock from exhibiting them. So much so is this that last year I went personally to see the owners of pure bred stock, and was met with the reply, "Why should I send my pure-bred Holsteins over there and pay a man three days' time to look after them, when any low scrub gets a premium at the county fair." I say we can establish a standard, but we must send our cattle there, and then we must have expert judges who are not influenced by anything but the quality of the animal itself. We have come to where there is a great deal of talk about the pure-bred animal, and very little about thorough-bred men and women, and it is time that we begin to take up this part of the question.

MR. KAHLER: I have been identified with county fairs for many years, and if there has been any disposition to favor the scrub cow over the other cattle, I am not aware of it. We try to have expert judges to judge the animals, and we pay more for purebred stock than we do for scrub cattle. We always try to have expert men who are unbiased for our judges.

DR. BECK: No matter what kind of a judge you may have, you will always hear complaints from some people about not getting their just dues. Last year we had a man who paid a thousand dollars and another who paid $15,000 for a prize bull. We had an expert judge, and he put the ribbon on the bull which cost $15,000.

MRS. SMITH: I want to say just one word more. I don't own any cows, so I was not hit very hard. The State Board of Agriculture was very good to us last year. They sent us Dr. Conard, who gave us a nice talk in front of the grand stand, with a nice herd of Holsteins. Then in the Womans' Department we had some nice talks. We have in our county many able women who could stand on a soapbox, if necessary, and talk for ten minutes on schools or household affairs. Last year you sent us Mr. Murray, of Columbia county. He gave us a splendid talk on apples. Right on the table there was an exhibit of apples all covered with the Scale, and the man did not know it. Side by side with it, was another exhibit of finest kind of apples, and the man didn't know it, and they at once became object lessons. It seems to me that this is the way to educate our people up to what they really need to know. I am not at the top of the class in efficiency, but I know it, and I want to learn and pass on my instructions, so that we can wake up the whole county. Then we want a Baby Show, and we want it bad; and there are a great many other things that we want to show people and get them interested.

MR. BLACK: Some years ago we appointed a committee, consisting of breeders of livestock in the different counties, and this committee was to select the names of the judges to be sent to the different fairs of the State. I think, that as the result of this, some of the counties have received considerable information. In our county we had Dr. Carl Gay, who was able to give us the reason for his judging, and I am sure that if our fair associations would take advantage of this, it would prove of great value.

MR. RODGERS: I have been identified for many years with the fair in Juniata county. We have always tried to get the best men possible, but whatever decision they gave, there were always some of them kicking. We changed that, and selected representative men from the State Board of Agriculture. Some of them came from a distance, and some of them from nearby counties, but since then we have not heard any complaints. The men chosen have been represented here, and they have been able to stand up and tell us why they gave the premium to that horse, or that cow, and I think no one has heard a word of complaint in our county since we have been getting our judges from the State Board of Agriculture.

MR. DEWITT: I wish to say that in Tioga county we have followed the same plan that Mr. Rodgers, but we go a little bit further. We put them in a ring, and place a policeman in the ring with them. Then we forbid anybody going into the ring, or around the cattle while the man is judging. If he wants to call attention to any horse, or cow, or sheep, he has the right to call the owner, or the party representing him, and we find that is a practical way to stop all of the kicking against the judging. We have had very little trouble the last five or six years in handling our cattle in that way.

It seems to me that this man from Allentown here made a few remarks reflecting on Tioga county. We have two fairs in Tioga county, but I believe in one good fair for each county, the State appropriation to go to it. With all due respect to the other fair, it is eking out a miserable existence. The buildings have become delapidated, and they can hardly meet the demands of the premiums, and it does look to me that one good fair in each county, and then the people take hold and boost it, would be better for the agriculture of the county.

DIRECTOR MARTIN: This subject has become intensely interesting. There is just one other thought, and that is the amusements at our county fairs. If there is any one here whose fair has made a success or real wholesome, high-toned amusement, I wish the gentleman would get up and tell us how to do it.

MR. DAVIES: Coming from a county where we have four fair associations, I realize, as said here, that one good fair would be better. But there is an incentive in having the four associations; each one simply puts forth every effort to become the best. In our county we have one association that has held its sixty-sixth annual fair. Last year we made up our minds that something must be done to wipe out our indebtedness, otherwise we would be forced out of existence. We had been paying anywhere from two to five hundred dollars for amusements. Last year we took local amusements entirely. We had a basket ball grounds laid out, which we devoted to playing for the championship of the county, and also for a fifty dollar prize. We also had a riding tournament, made up entirely of county men, and all the principal organizations of the county sent representatives there to compete for the prize, which was a silver cup. Everybody said it was the most successful fair we ever had, and one of the most interesting and instructive we had ever held.

Speaking of judges, we have had the same trouble as the others, but this year we expect them from State College, and also have Dr. Gay.

In regard to the Ladies' Department and home work, we have expert judges there; because we find the ladies, as well as the men, take offence, we get them from outside. Our fair is now on the best basis it has ever been from the time I can remember.

DR. BECK: In regard to fair amusements, I believe one of the most successful fairs I have ever seen has never had any form of amusement—not even a horse race. I refer to our neighbors just across the line, at Toronto, who refused to reciprocate or to become annexed.

MR. FENSTERMAKER: There is a danger line in amusements. Now, the great Allentown Fair may just be reaching that line. We spend five thousand dollars for a horse, and three thousand for a man to fly for three days. I believe we spend about ten thousand dollars for amusements in the three days. Some of us have been advocating, in a quiet way, a Judges' Pavilion, where the judge can explain why the animal wins, as it passes by, and I believe in experimental plots, and things of that sort. The time may come when we can have them.

The SECRETARY: I would like to ask the gentleman who speaks so enthusiastically about Toronto: Are the people there so interested in instruction that they will listen to the speakers? We are called upon to furnish speakers—especially Mr. Martin is, but my experience has been that the speaker does not get the attention. Suppose it is due to the speaker, but they seem to prefer amusement to instruction.

MR. DAVIES: There is always a certain element that amusement attracts, but we can have amusements, and we can have instruction. There are always people who are anxious to learn, and we can have both. If the Secretary comes to us I will guarantee him a good and attentive audience.

MRS. SMITH: I have been talking a great deal with the New York people across the line, and the Cornell people have been sending speakers out. One of them says he discovered that it is the man who does something with his hands that can get the attention of the people, whereas the man who uses only his lungs cannot get an audience. I tried last year to talk against a moving crowd on our schools. The women near me could get what I said, but to try to talk against a moving crowd is very trying to the nerves, and I do not think I shall attempt it in the same way again. I think I will try a small megaphone this year.

DIRECTOR MARTIN: We have with us an expert poultry judge; perhaps he can give us some light on this matter of judging. I should like to hear from Mr. Wittman.

MR. WITTMAN: The first thing I should see to is that none of the officers of the fair, and none of the employees would show poultry, and then I would get the best judges from outside, so there would be no local prejudice enter into it. I was very sorry to hear a man talk this morning of having a policeman beside the judge. I would like to hear a man ask why he did not get a prize. His answer might be full of information to him. At our National Convention at Denver we had a fight of almost a day on the subject of judging poultry openly, and I am glad to say we won. Heretofore they have always had closed judging in poultry. If everybody hears what is said, there cannot be any claims of unfairness. Of course, it puts the judge on a high moral plane. He has to be proof against any outside influences. He has to judge a bird on its merits. I don't believe the fair can spend money to a better adventage than to get the very best judges, and that is the only way you can win the best bred animals of your county. A man who knows more about animals than the judge does, is not going to send his animals there to be judged by a man who knows nothing about them.

MRS. SMITH: I wonder whether the gentleman has any suggestion to make about getting the poultry out of the boxes so that the audience can see them? Also a cow that is to be judged, so that the audience can learn the points of a good dairy cow? Some of us are very anxious to know a better way of judging poultry than just by the notches in their combs. You know most people are breeding mixed breeds, and we want a judge who will get down to better instruction of the people by pointing out the good points of the pure bred stock, and showing wherein the pure-bred is better than the cross-bred. Such a judge could do more things than judge.

The CHAIRMAN: The Chair would state that we have allowed a great deal of latitude in these discussions. In the first place, because there are some new members who may feel a little out of place until the ice is broken. But now the time is approaching when we must adjourn this session. I would like to state that the session this afternoon will be presided over by the member from this county, Mr. Kerrick, who will call to order at 1.30. The first thing on the program will be an address of welcome by the Hon. William Maxwell, Judge of the Bradford County Court; he will be followed by Benj. Kuykendall, Esq., President of the Bradford County Agricultural Society, and by G. E. Frost, Esq., the Burgess of Towanda. The response to these addresses of welcome is expected to be made by Hon. John K. Tener, Governor of Pennsylvania. I suppose he will be on hand, although I have not yet heard of his arrival here. After this we will be addressed by the Hon. Edward M. Bigelow, State Highway Commissioner, on "Facts about Road Construction: the New Law."

DIRECTOR MARTIN: The Governor has made a very strong personal effort to be here, but owing to the meeting of the Supreme Court and several other important meetings which take place this week, he may be unable to be here. In case he does not come, we have with us the Secretary of Agriculture who will take his place, after which the meeting will be open for any remarks the members wish to make.

MR. BLYHOLDER: In reference to the several important meetings in Harrisburg this week, the one most important to us is the one on Friday, in reference to agriculture education. I should be sorry to see this meeting go by without any recognition, and I think our Board should be represented, because I think the question of agriculture in our rural schools is one of the most important that can be brought up.

DIRECTOR MARTIN: May I be permitted an inquiry? I understand that invitations have been sent out, and I would like to ask the Secretary whether an invitation has come to us?

The SECRETARY: None has come to me for the Board, or for, the Department, but I have received one personally, and when the proper time comes, I shall ask to be excused so as to get there. Still I see no reason why we should not show our interest in the question by sending one or two of our members there. The representation need not be very large.

DIRECTOR MARTIN: I fully realize the importance of the meeting, and yet we feel loath to see our members go because of their interest in their own work.

MR. FENSTERMAKER: I see no reason why we should not send a good representation. It is a very important meeting, and a very important question. Our Superintendent of Public Instruction has held it back for ten years. He says we are not prepared for it. The whole truth is, that he is not prepared for it. We should have had it twenty-five years ago, and I think it entirely fitting that some one should be sent there to prod him up.

MR. KESTER: For a number of years I have gone over the State and tried to arouse interest in agricultural education. I have talked personally with the State Superintendent, and I think the last time I talked with him I saw a change of heart. and I think we should bring the matter to his attention. I might say that I think of asking the Chairman to get away in time to be there.

MR. BLYHOLDER: I have also received an invitation from both parties, but I have in mind a representation from the Board.

The SECRETARY: I would like to have an expression of the sentiments of the members of the Board. I think Mr. Martin is jealous of his work, and anxious to keep his people here, and I am glad to see this interest in his business, but if the members do desire, I think a small representation can be arranged without materially affecting Mr. Martin's part of the work.

DIRECTOR MARTIN: Personally, I would say, I realize the importance of the meeting, and I have had an invitation to be present and expressed my regrets that that meeting and our State meeting would take place at the same time, but I simply wish to remind you that the State Board has received no invitation.

PROF. MENGES: The Secretary has already said that he shall ask permission to leave here and attend the meeting. Why could not the Secretary represent this Board and deliver the message that this Board wishes to send that Organization? I simply make this as a suggestion. I cannot make it as a motion, as I am not a member of the Board.

MR. FENSTERMAKER: Harrisburg is on the way home of many of us, and I think it would be well for as many of us as possible to go there. I think the Secretary will agree that two or three men may lose the last half day's session in order to attend that meeting.

DIRECTOR MARTIN: But I don't want to ask them to lose last half day's session.

MR. FENSTERMAKER: But that meeting is much more important than the last half days' session. I would like Mr. Blyholder and two or three others who go that way to stop off and represent us.

MR. A. P. YOUNG: Who is responsible for this meeting?

The SECRETARY: My invitation comes from the State Grange, but is not signed by it. The Governor is interested: I do not know who is the authority, but I am under the impression that the State Grange is responsible.

MR. W. F. BIDDLE: I move you that our worthy Secretary be made to represent our Board at that meeting.

MR. FENSTERMAKER: Would it be well also to include Mr. Kester and Mr. Blyholder?

DR. BECK: I make that amendment.

The SECRETARY: If it is to be a Committee to represent the Board, let us be sure that these gentlemen are members of the Board. Is Mr. Blyholder a member of the Board?

MR. BLYHOLDER: Yes, sir.

The SECRETARY: How about Mr. Kester?

MR. KESTER: I am not.

The CHAIRMAN: Then it will have to be the Secretary and Mr. Blyholder.

The CHAIRMAN: Are you ready for the question?

The question having been put and a vote taken, the motion was found to have been carried in the regular way.

MR. JOEL A. HERR: I move we adjourn.

This motion having been properly seconded and duly carried in the regular way, the session adjourned to meet again at the call of the Vice-President.

N. B. CRITCHFIELD
Secretary.

LIST OF COUNTY INSTITUTE MANAGERS FOR THE SEASON OF 1911-12

County	Name and Address of Chairman
Adams,	A. I. Weidner, Arendtsville.
Allegheny,	A. J. Purdy, Imperial, R. D.
Armstrong,	S. S. Blyholder, Kelly Station.
Beaver,	A. L. McKibben, New Sheffield.
Bedford,	W. F. Biddle, Everett, R. D. No. 2.
Berks,	H. G. McGowan, Geigers Mills.
Blair,	W. F. Beck, No. 1927 W. Chestnut St., Altoona.
Bradford,	F. D. Kerrick, Towanda, R. D. No. 9.
Bucks,	Watson T. Davis, Ivyland.
Butler,	W. H. Milliron, Euclid.
Cambria,	James Westrick, Patton.
Cameron,	F. X. Blumle, Emporium.
Carbon,	Edw. Lienhard, Mauch Chunk, R. D.
Center,	John A. Woodward, Howard.
Chester,	M. E. Conard, Westgrove.
Clarion,	J. H. Wilson, Clarion.
Clearfield,	Peter Gearhart, Clearfield.
Clinton,	Joel A. Herr, Millhall, R. D.
Columbia,	A. P. Young, Millville.
Crawford,	J. S. Patton, Hartstown.
Cumberland,	T. J. Ferguson, Mechanicsburg.
Dauphin,	E. S. Keiper, Middletown.
Delaware,	E. J. Durnall, Swarthmore.
Elk,	John G. Schmidt, St. Marys.
Erie,	Archie Billings, Edinboro.
Fulton,	J. L. Patterson, McConnellsburg.
Fayette,	T. H. Smith, Dunbar, R. D. No. 32.
Forest,	C. A. Randall, Tionesta.
Franklin,	J. P. Young, Marion.
Greene,	J. W. Stewart, Jefferson.
Huntingdon,	G. G. Hutchison, Warriors Mark.
Indiana,	S. C. George, West Lebanon.
Jefferson,	Peter B. Cowan, Brookville, R. D. No. 4.
Juniata,	Matthew Rodgers, Mexico.
Lackawanna,	Horace Seamans, Factoryville.
Lancaster,	J. Aldus Herr, Lancaster, R. D. No. 4.
	E. K. Hibshman, Ephrata.
Lawrence,	Sylvester Shaffer, New Castle, R. D.
Lebanon,	Edw. Shuey, Lickdale.
Lehigh,	P. S. Fenstermaker, Allentown.
Luzerne,	J. E. Hildebrant, Dallas, R. D. No. 2.
Lycoming,	A. J. Kahler, Hughesville.
McKean,	O. W. Abbey, Turtle Point.

County	Name and Address of Chairman
Mercer,	Wm. C. Black, Mercer.
Mifflin,	M. M. Naginey, Milroy.
Monroe,	F. S. Broug, Saylorsburg.
Montgomery,	J. H. Schultz, Norristown.
Montour,	J. Miles Derr, Milton, R. D. No. 1.
Northampton,	C. S. Messinger, Tatamy.
Northumberland.	I. A. Eschbach, Milton, R. D. No. 1.
Philadelphia,	Samuel K. Foster, Torresdale.
Perry,	A. T. Holman, Millerstown.
Pike,	B. F. Killam, Paupack.
Potter,	A. T. Crittenden, Oswayo.
Schuylkill,	John Shoener, New Ringgold.
Snyder,	J. S. Kauffman, Middleburg.
Somerset,	J. C. Weller, Rockwood, Pa., R. D. No. 2.
Sullivan,	E. R. Warburton, Campbellville.
Susquehanna,	F. A. Davies, Montrose.
Tioga,	C. H. DeWitt, Mansfield.
Union,	J. Newton Glover, Vicksburg.
Venango,	W. A. Crawford, Cooperstown.
Warren,	Geo. A. Woodside, Sugargrove.
Washington,	D. S. Taylor, Burgettstown, R. D. No. 3
Wayne,	W. E. Perham, Pleasant Mt.
Westmoreland,	M. P. Shoemaker, Greensburg.
Wyoming,	D. A. Knuppenburg, Lake Carey.
York,	G. F. Barnes, Rossville.

LIST OF INSTITUTE LECTURERS FOR SEASON OF 1911-12

Anderson, H. M., New Park, Pa.
Arny, L. W., New Britain, Pa.
Baker, D. B., Dillsburg, Pa.
Baker, Prof. Hugh P., State College, Pa.
Barnitz, Chas. M., Riverside, Pa.
Bond, M. S., Danville, Pa.
Bonsteel, F. E., Bear Lake, Pa.
Burnite, Miss Mary A., No. 509 W. 121st St., New York City
Campbell, J. T., Hartstown, Pa.
Card, Fred W., Sylvania, Pa.
Carter, Miss Arabella, No. 1305 Arch St., Philadelphia, Pa
Clark, M. N., Claridge, Pa.
Cochel, Prof. W. A., State College, Pa.
Conard, Dr. M. E., West Grove, Pa.
Cook, Walter A., State College, Pa.
Cooke, Prof. Wells W., Department of Agriculture, Washington, D C.
Coruman, Chas. T., Carlisle, Pa.
Detrich, Dr. J. D., No. 438 Adams Avenue, Scranton, Pa.
Dorsett, E. B., Mansfield, Pa.
Drake, W. M. C., Volant, Pa.
Eschbach, I. A., Milton, Pa., R. D. No. 1.
Fassett, F. H., Meshoppen, Pa.
Foulke, Miss Jean Kane, West Chester, Pa.
Fulton, Prof. H. R., State College, Pa.
Frear, Dr. Wm., State College, Pa.
Funk, Dr. J. H., Boyertown, Pa.
Funk, Sheldon W., Boyertown, Pa.
Gardner, Prof. Frank D., State College, Pa.
Gooderham, H. M., Patton, Pa.
Goodling, C. L., State College, Pa.
Herr, Joel A., Millhall, Pa., R. D.
Hibshman, E. K., Ephrata, Pa.
Hull, Geo. E., Transfer, Pa., R. D.
Jackson, Prof. Homer W., State College, Pa.
Johnston, J. B., New Wilmington, Pa.
Kahler, A. J., Hughesville, Pa.
Kester, R. P., Grampian, Pa.
Kline, Frank, Spring City, Pa.
Lighty, L. W., East Berlin, Pa.
Mairs, Prof. T. I., State College, Pa.
McCallum, M. H., Wernersville, Pa.
McCurdy, C. C., Hartstown, Pa.
McDowell, M. S., State College, Pa.

McIntire, W. H., State College, Pa.
Menges, Prof. Franklin, York, Pa.
Mitchell, R. V., State College, Pa.
Monroe, Mrs. Geo. E., Dryden, N. Y.
Murray, D. E., Catawissa, Pa.
Myers, C. E., State College, Pa.
Noll, Chas. F., State College, Pa.
Northup, H. W., Dalton. Pa., R. D.
Owens, Prof. Wm. G., Lewisburg, Pa.
Patton, W. M., Mosgrove, Pa.
Peachey, J. H., Belleville, Pa.
Philips, T. J., Atglen, Pa.
Phillips, E. L., New Bethlehem, Pa.
Phillipy, Dr. W. T., Carlisle, Pa.
Rich, Chas. H., Woolrich, Pa.
Ross, Warren G., State College, Pa.
Severson, B. O., State College, Pa.
Seeds, Robt. S., Birmingham, Pa.
Shaw, Prof. Chas. F., State College, Pa.
Stout, W. H., Pinegrove, Pa.
Thomas, Miss Sara P., Philadelphia, Pa.
Van Noy, Leon Otice, Troy, Pa. No. 66.
Watts, D. H., Kerrmoor, Pa.
Weld, R. J., Sugargrove, Pa.
Wittman, W. Theo., Allentown, Pa.
Woodman, S. Paul, Rushland, Pa.
Zeigler, Mrs. Sarah B. F., Duncannon, Pa.

MEETING OF THE FARMERS' ANNUAL NORMAL INSTITUTE

PROGRAM

First Session Convenes Tuesday Afternoon, May 21, 1912.

MR. F. D. KERRICK, Towanda, Pa., Chairman.

Call to order 1.30.

Addresses of Welcome, by Hon. Wm. Maxwell, Judge, Bradford County Court, Towanda, Pa.

Benj. Kuykendall, Esq., President, Bradford County Agricultural Society, Towanda, Pa.

G. E. Frost, Esq., Burgess, Towanda, Pa.

Response, by Hon. John K. Tener, Governor of Pennsylvania, Harrisburg, Pa.

1. "FACTS ABOUT ROAD CONSTRUCTION: THE NEW LAW."
Hon. Edward M. Bigelow, State Highway Commissioner, Harrisburg, Pa.

Tuesday Evening, May 21, 1912.

MR. C. H. DEWITT, Mansfield, Pa., Chairman.

Call to order 7.30.

1. "ORGANIZATION FOR SOIL EFFICIENCY."
Dr. Thomas F. Hunt, Dean, Experiment Station, State College, Pa.

2. "THE FARMER AND THE CHESTNUT BLIGHT."
Prof. Samuel B. Detwiler, Executive Officer, Chestnut Blight Commission, Philadelphia, Pa.

Wednesday Morning, May 22, 1912.

MR. D. A. KNUPPENBURG, Lake Carey, Pa., Chairman.

Call to order 9.30.

1. "CARE AND MANAGEMENT OF THE ORCHARD."
F. H. Fassett, Meshoppen, Pa.

2. "FEEDING AND MANAGEMENT OF DAIRY COWS."
Prof. H. E. Van Norman, State College, Pa.

Wednesday Afternoon, May 22, 1912.

MR. F. A. DAVIES, Montrose, Pa., Chairman.

Call to order 1.30.

1. "LIVESTOCK SANITATION."
Dr. C. J. Marshall, State Veterinarian, Harrisburg, Pa.

2. "HORSE BREEDING AND MANAGEMENT."
Dr. Carl W. Gay, Director Horse Breeding, University of Pennsylvania, Philadelphia, Pa

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Wednesday Evening, May 22, 1912.

MRS. JEAN KANE FOULKE, West Chester. Pa., President.

Call to order 7.30.

1. "HOME HYGIENE."
Miss Mary A. Burnite, No. 509 West 121st St., New York City.

2. "RURAL UPLIFT."
Mrs. E. E. Powers, Pennsdale, Pa.

3. "HYGIENE AND SANITATION IN THE PUBLIC SCHOOLS."
Dr. A. L. Russell, Midway, Pa.

Thursday Morning, May 23, 1912.

MR. A. T. CRITTENDEN, Oswayo, Pa., Chairman.

Call to order 9.30.

1. "IMPORTANCE OF FIELD WORKERS FOR THE DEVELOPMENT OF BETTER METHODS IN AGRICULTURE."

Dr. J. D. Detrich, Chatham, N. Y.
L. W. Lighty, East Berlin, Pa.

2. "USE OF DYNAMITE IN FARM OPERATIONS."
(Illustrated.)

Willard Young, Wilmington, Del.

Note:—Demonstrations by actual practice will be made on a nearby farm.

Thursday Afternoon, May 23, 1912.

HON. A. L. MARTIN, Director, Harrisburg, Pa., Chairman.

Call to order 1.30.

1 "REPORT OF COMMITTEE ON CO-OPERATION."

Messrs. R. P. Kester, Grampian, Pa.
E. P. Dorsett, Mansfield, Pa.
Archie Billings, Edinboro, Pa.

2. "CO-OPERATION OF FARMERS."

Prof. Franklin Menges, York, Pa.

3. THIS PERIOD WILL BE DEVOTED TO THE IMPROVEMENT OF INSTITUTE WORK.

Note:—The session is open for discussion to all County Chairmen of Institutes and Lecturers, and it is expected that each member will come prepared to offer a suggestion looking to the development of the work. Five minutes' time is allotted to each member.

Thursday Evening, May 23, 1912.

MR. W. A. CRAWFORD, Cooperstown, Pa., Chairman.

Call to order 7.30.

1 "SOME LESSONS IN NATURAL HISTORY."
(Illustrated with lantern slides.)

W. H. Stout, Pinegrove, Pa.

2. "MODERN METHODS OF FINISHING AND DRESSING POULTRY."
(Illustrated with lantern slides.)

Prof. R. V. Mitchell, State College, Pa.

3. "FARM BUILDINGS OF CONCRETE."
(Illustrated with lantern slides.)

E. S. Fowler, Chicago, Ill.

PROCEEDINGS OF THE FARMERS' ANNUAL NORMAL INSTITUTE, HELD IN THE COURT HOUSE, TOWANDA, PA., MAY 21-24, 1912.

Towanda, Pa., May 21, 1912, 1.30 P. M.

Mr. Kerrick in the Chair.

The CHAIRMAN: The meeting will please come to order. The Secretary will please call the roll.

This and subsequent roll-calls showed the following members present:

COUNTY INSTITUTE MANAGERS

A. I. Weidner,	Adams county.
A. J. Purdy,	Allegheny county.
S. S. Blyholder,	Bedford county.
W. F. Biddle,	Blair county.
W. F. Beck,	Bradford county.
F. D. Kerrick,	Bucks county.
Watson T. Davis,	Armstrong county.
James Westrick,	Cambria county.
Edw. Leinhard,	Carbon county.
M. E. Conard,	Chester county.
J. H. Wilson,	Clarion county.
Joel A. Herr,	Clinton county.
A. P. Young,	Columbia county.
J. S. Patton,	Crawford county.
T. J. Ferguson,	Cumberland county.
E. S. Keiper,	Dauphin county.
John G. Schmidt,	Elk county.
Archie Billings,	Erie county.
J. L. Patterson,	Fulton county.
J. W. Stewart,	Greene county.
S. C. George,	Indiana county.
Peter B. Cowan,	Jefferson county.
Matthew Rodgers,	Juniata county.
Horace Seamans,	Lackawanna county.
J. Aldus Herr,	Lancaster county.
E. K. Hibshman,	Lancaster county.
Sylvester Shaffer,	Lawrence county.
Edward Shuey,	Lebanon county.
P. S. Fenstermaker,	Lehigh county.
J. E. Hildebrant,	Luzerne county.
A. J. Kahler,	Lycoming county.
W. C. Black,	Mercer county.
M. M. Naginey,	Mifflin county.
F. S. Brong,	Monroe county.
J. H. Schultz,	Montgomery county.

C. S. Messinger,	Northampton county.
I. A. Eschbach,	Northumberland county.
Samuel K. Foster,	Philadelphia county.
A. T. Holman,	Perry county.
B. F. Killam,	Pike county.
J. C. Weller,	Somerset county.
E. R. Warburton,	Sullivan county.
F. A. Davies,	Susquehanna county.
C. H. DeWitt,	Tioga county.
J. Newton Glover,	Union county.
W. A. Crawford,	Venango county.
George A. Woodside,	Warren county.
D. S. Taylor,	Washington county.
W. E. Perham,	Wayne county.
D. A. Knuppenberg,	Wyoming county.
G. F. Barnes,	York county.

INSTITUTE LECTURERS

H. M. Anderson, Chas. M. Barnitz, M. S. Bond, F. E. Bonsteel, Miss Mary A. Burnite, J. T. Campbell, Fred W. Card, Mrs. Arabella Carter, M. N. Clark, Prof. W. A. Cochel, Dr. M. E. Conard, Chas. T. Cornman, Dr J. D. Detrich, E. B. Dorsett, W. M. C. Drake, I. A. Eschbach, F. H. Fassett, Mrs. Jean Kane Foulke, Sheldon Funk, H. M. Gooderham, Joel A. Herr, E. K. Hibshman, Geo. E. Hull, A. J. Kahler, R. P. Kester, Frank Kline, T. I. Mairs, M. H. McCallum, C. C. McCurdy, M. S. McDowell, Prof. Franklin Menges, R. V. Mitchell, Mrs. Geo. E. Monroe, H. W. Northup, J. H. Peachey, T. J. Philips, E. L. Phillips, Charles H. Rich, Robt. S. Seeds, W. H. Stout, Miss Sara Thomas, Leon Otice Van Noy, D. H. Watts, W. Theo. Wittman, S. Paul Woodman, Mrs. Sarah B. F. Ziegler.

The CHAIRMAN: Has the Deputy Secretary any reports to make?

The DEPUTY SECRETARY: Yes, sir: I wish to say that I have here a letter from the Governor, in which he writes to express his sincere regrets at not being able to be here owing to several important meetings which are held at Harrisburg this week. Also a letter from General Beaver, expressing his regret that his health will not permit him to be present with us at this meeting.

The CHAIRMAN: Ladies and Gentlemen: It affords me great pleasure to see your faces this afternoon, and to meet the members of the State Board of Agriculture of this great State of Pennsylvania. After all the hardships of the winter, the good Lord has provided us with sunshine and pure air this afternoon, and I appreciate very much meeting you here. We hope that while you are in our old county of Bradford, we may be able to make it pleasant for you during your stay with us. I know what the organization has done for the agricultural people. You can go around over the State, and wherever you find farmers gathered together, you will find them discussing how to better the conditions of the soil, or how much lime to use on it, or how much fertilizer it is best to use. This organization has brought all this about, and I appreciate very much myself what the efforts of this organization has done.

Without any further remarks, I take great pleasure, ladies and gentlemen, in introducing to you the Hon. Judge Maxwell, who will make the address of welcome.

Judge Maxwell spoke as follows:

ADDRESS OF WELCOME

By HON. WM. MAXWELL, Towanda, Pa.

Mr. Chairman, and Members of the State Farmers' Normal Institute, Ladies and Gentlemen: On behalf of the people of Towanda and of the County of Bradford, we extend to you a most cordial welcome to the county seat of Bradford county.

We realize that many of you, undoubtedly, have come a considerable distance to Towanda with this Institute when other places might have been more acceptable, and where your entertainment might have been better than we can give you—possibly places where they might have had more local attractions to show you than we are able to furnish you at this place; but I assure you that no place could have been selected by you where you could be more welcome, where the people would be more glad and feel more glad, than we are, by the selection of this place to hold this Institute, and therefore we give you a most cordial welcome. It is seldom that we have the opportunity to extend the hospitalities of our town to such a distinguished gathering as we have at this time, and we appreciate the fact that you gentlemen have gone to considerable trouble to come here in order that we might, drink at the fountain of knowledge and be benefitted by your coming here to teach us a better agriculture.

After you have stayed with us during your sessions, mixed with our people and have seen some of our farms that we are able to show you, and after you have seen the interest our people are taking, and the progress they are making, especially our farmers, in and along agricultural lines, you will agree that while we are not living in the most populous community of this Commonwealth, our farmers are alive to the spirit of the times. You will see that our farmers who live on these hillsides and in these valley, are not only good citizens, but are a progressive lot of people, living in good country homes. They have their stock in good, sanitary buildings, and they feed them along scientific principles, and I suppose that accounts, in a measure, for the good butter that Bradford county has the reputation of making. As you know, it stands well in the market and commands the highest price.

We are living today in what might be called an age of whirlwind. Things are not done as they were years ago. The old canal boat with its mules has given way to the steam and electric roads. The aeroplane has come to stay and furnish business for the undertaker. The more danger, the better, I think, our people like it. The automobile has become a necessity, and is fast displacing the horse. In fact, these improvements are going on at a terrific rate.

It is the same in matters of State and political matters. We are now voting in some states for direct Presidential elections. We will soon be voting directly for United States' Senators. In some states the ladies are already voting, and they have shown their good judgment in matters of State. And I have no doubt that in agriculture the improvements have been just as great. The same strides have been made. The old sickle and grain cradle have been succeeded by the reaper and binder; the scythe and sneath by the mowing machine; the old-fashioned plow by the sulky plow, and that in its turn by dynamite. And the Lord only knows what next; I suppose it will be the millenium. Agriculture has kept up with the spirit of the times in the matter of improved machinery and the education of the people.

Now, I have but one suggestion to make, and it is this; and I think it is the solution of the abandoned farm. We have some of them in this county. It has been a matter of regret to see our farms abandoned, and it has been a rather difficult problem to determine just what was the cause.

In the first place—and this is largely true of a small class of farmers—they are educated along the line of their business. They wander along through the Street of Haphazard, and trust to the elements to do the rest for them; they go ahead and farm along the lines of their father and grandfather. The result has been that they fall by the wayside. They become discouraged, and every man they come in contact with is discouraged by the result of their failure. They bring up their boys to believe that farming does not pay, and teach them to go into other business.

Another class have the idea that the farmer is not quite well dressed enough. Very silly. They have an idea that because the farmer has a little dirt on his shoes, or he does not dress quite so fashionably as some other people, he is not respected, and they bring up their children to believe that they must go to some of the more populous sections and dress well, in order to be respected. That is one reason for the abandoned farm.

Another reason for the abandoned farm, is that our people of the East could not compete with the farmers of the West. The railroads would bring the stuff in from the West and lay it at our doors at a less price than the people of the East could produce for.

Now, my idea of farming is to make it profitable, in the first place. The pendulum has been swinging away from the farm for years, but it is now beginning to swing the other way again. Men of education are giving their whole time to farming, and they have made a pleasure of it because they were educated to farm in an intelligent and profitable way.

Now, take a young man who wants to follow the legal profession. He must have a good common school education, at least; then he must submit to an examination by a State Board of Examiners to determine whether he is entitled to study law or not. If they report favorably, he can begin to study. If he is under twenty-one, he must study three years; if over twenty-one, two years, and then undergo another examination to see whether he is qualified to practice. You take the surgeon and the physician. After a common school education, they have to go along the same lines. Then after they have studied for three or four years, they have to undergo another examination to see whether they are fit to practice the profession. You take a minister, or a civil or mechanical engineer, and you will find the same thing. Take any other line except that of farming, and you will find that a man has to go through a period of training in order to qualify to do his work, and if it is necessary for these classes, it is much more necessary for the farmer. It is much more important to him than his geography or the history of the country. It will do him more good to know the principles of farming, than to know the cause of the rise and fall of the Roman Empire. What we want to do is to give people an education in and along the lines of work they are to follow. If you understand the soil and its principles and elements, you understand every principle of agriculture, and what will be the result? Where we are now growing poor fruit and very little of it, we will be growing good fruit and more of it on the same trees. Where one blade of grass is growing, two would grow. The result would be that farming would become profitable, and if one man makes a success of it, his neighbors will take it up. You never see a man make a success of a thing that you don't see two other fellows ready to follow. So it is with farming.

If a man cannot afford to educate his boys in the line of work in which they are to engage, let the State do it. I don't believe there is a farmer in Bradford county, or in the State of Pennsylvania, who cannot afford to buy the necessary education for his boys. Let him smoke fewer cigars or drink less intoxicating liquor, and he can spend his evenings in educating himself. If the State of Pennsylvania can afford $50,000,000 for the improvement of the public roads of the Commonwealth, let them take one fiftieth of that amount and furnish a public library to the Commonwealth. I would take the young men and boys who are to engage in farming, and educate them along this line, and what would be the result? They would make money in farming, and if one man can make it, another can. They simply do not understand it. I believe in book farming myself. I believe that the better education you can give a young man starting out on the farm, the larger will be the proportion of profits in the business which he undertakes. The result will be that you will make him a better man, a better citizen, and you will have solved the high cost of living as I think it would be better to do it.

Now, gentlemen, this, to my mind, is the solution of the abandoned farm, and you, gentlemen, are in a position to bring it about. There is no reason why we cannot teach every young man the desirability of following farming. If his father cannot afford to educate him, the State can afford to do it. That is my solution of the abandoned farm. I want to say to you that a man cannot farm without an adequate education along the line of his work, any more than he can practice law, or cure you of disease, or follow any other profession. It is simply ridiculous when we stop to think of it. And it has been the history of the past that men who make failures of everything else can go out on the farm. But then when he reaches the noon day of his life, he discovers that he has made a mistake—made a failure of this, too, simply because he didn't understand it.

"They told me the way I took was hard;
That many a time my weary feet would bleed;
They said at last I'd find my way way barred;
I would not heed.

"They bade me turn and go the other way;
'This way,' they said, 'with thorns and thistles strewn';
But I was young; ambition led the way.
I thought I knew.

"But when my bleeding feet came to the end,
And I bound and scourged by cruel fate,
'Alas!,' I cried, 'please let me start again.
But it was too late."

Now, gentlemen, in conclusion, I want to again assure you of your cordial welcome to the City of Towanda. We will turn over to you the keys of the town, the jail and the lockup, and this will assure you of a safe return to your homes. That you may have a successful Institute, and return in safety to your homes, is, gentlemen, the sentiment of this community.

The CHAIRMAN: At our Board meeting this morning, we had up the county fair for discussion. I see the President of our Agricultural Society is here, and I take pleasure in introducing to you Mr. Kuykendall, who will address you.

Mr. Kuykendall addressed the meeting as follows:

ADDRESS OF WELCOME

By BENJ. KUYKENDALL, ESQ.

Mr. Chairman, Members of the State Board of Agriculture, State Lecturers, Ladies and Gentlemen: It hardly seems necessary for me to say a single thing, since this Court of Agriculture has been duly and legally opened by the Judge thereof, and I believe that I am not living up to the duty entrusted to me by the local people if I remain here for any length of time, when I should be on the streets to welcome those who are coming in on the afternoon train. I have already met the most of those gathered here, and so far as possible, I have extended to them the hearty greeting of my hand.

After the first news of the battle of Manila, the people were eagerly awaiting the returns. Upon the streets of New York, thousands upon thousands of people were gathered to read the news as thrown upon a screen in front of one of the large newspapers of the city. Suddenly there appeared on the screen the news that Wilkes-Barre had gone Republican. Immediately came from some one in the throng "Where is Wilkes-Barre?", and at once back came the reply from some patritic citizen in the crowd, "Seventy-nine miles south of Towanda." And so you see, my friends, this great metropolis of Towanda is the point from whence distance is computed.

My friends, you have come to a section of country where the red blood of Connecticut still flows in our veins; you have come to a section where the latch-string always hangs out and where the work of the Department of Agriculture has taken root and sprung up; and for that reason, the people of Bradford county and of this little Borough of Towanda give you a most cordial welcome. We have given to the State Board of Agriculture one of its most conservative members, and for this reason, also we welcome you; and when you leave us to return again to your homes, we want you to feel that you have been among friends; that it has been good to have been with us, and that your meeting has been a profitable one. Again, I welcome you.

The CHAIRMAN: We have with us the Mayor of the town. I will now introduce to you Mr. Frost, who will also speak to us.

Mr. Frost spoke as follows:

ADDRESS OF WELCOME

By G. E. FROST, ESQ., Towanda, Pa.

Mr. Chairman, and Members of the Farmers' Normal Institute: I wish to say, in the first place, that the speech-making is not in my line. This is the first time I have ever had occasion to appear before an audience of this kind. I know it is customary when gatherings of this kind come to the city, to welcome them. Just what it is for, I don't know—whether we need any more jails, or whether we need add any extra policemen to our force, I don't know, but I don't think we need do it for you gentlemen.

I don't think I can add anything to the welcome you have received from my predecessors, Judge Maxwell and Mr. Kuykendall; but I assure you that we are pleased to have you with us today, and I, as the chief executive of this far-famed city, wish to extend to you a most hearty welcome.

The CHAIRMAN: We have on the program a response by the Governor. In his absence I will take the liberty of calling upon our worthy Secretary, the Hon. N. B. Critchfield.

Secretary Critchfield responded to these addresses of welcome as follows:

ADDRESS OF SECRETARY CRITCHFIELD

Mr. Chairman, Judge Maxwell, Mr. Kuykendall, Mr. Frost, Ladies and Gentlemen: I was in Union county a few years ago attending a Farmers' Institute. At one of the evening sessions the Congressman of the district was expected to speak "to the young people" and the young people sat there quietly waiting for him to put in an appearance, but he didn't come, and the manager came to me and said, "You will have to address them." The meeting was in a country church and the house was full to overflowing. Well, I got up into the pulpit, and held on to the table to keep myself from trembling. It is not easy to fill the place of some one else from whom a great deal is expected, and I did not hope to succeed in holding the attention of that audience half as well as the Congressman would have done. I saw in the audience before me a good old Baptist minister, eighty-four years old, and I said to him, "My brother, will you tell me how old a man must be before he is relieved from what is called 'stage fright'," and he answered, "You must ask some one older than I am."

I was gratified to listen to these excellent speeches; there was not a "Frosty" one among them. There is always something in the faces of the people who bid us welcome that talks to our hearts even more distinctly than words do, and there are cases when we would just as soon that they did not welcome us, as to have them do so. Such however, is not the case here; we feel that we are among friends.

Last evening coming up on the train, the conversation was all about the beautiful scenery, and then when we came to Towanda and saw the beautiful town, and met the cordial welcome, we felt that our lines had fallen to us in pleasant places.

We are glad to be here because we are farmers and Towanda is an agricultural town, surrounded by a most beautiful agricultural section of our country.

At some places to which we go they take us into great iron mills and other large manufactories but the interest we feel in them is naturally small, compared with the interest we have in the fact that you people of Bradford county have about 3% of the 240,000 farms of the State. You have between seven and eight thousand farms in Bradford county. So we feel that we are right among our own people.

And then we are glad to be here for another reason. We have come into a county that has a history—a county that had an important part in making some of the most important history of this great country of which we are all a part. Among the names of those who have done great things stand out that of David Wilmot. I can remember just as well as though it were yesterday, of my father reading about David Wilmot and what he was doing in Congress. Some of you may remember that after the close of the Mexican War, President Polk sent a message to Congress asking for an appropriation of $2,000,000, to pay for the lands that were ceded to the United States as the result of the war. That was the great cause of the war, the annexation of Texas—and by the way, there comes to my mind just now a little story, which I'm going to tell you. During the Presidential campaign of 1844, when the main issue was the annexation of Texas to the United States, I was a little boy, but I went with my father to a political meeting and I heard A. J. Ogle make a speech. He said, "I have just come from Berks county; they are all Democrats there," (He was a Whig). "In going over the county I stopped at a barn where some men were threshing and asked one of the men how they were going to vote"; he said, "I don't know yet; the man who tells us how to vote didn't come around yet, but I guess Polk and Texas are both good men."

But to return to my subject; David Wilmot got up in Congress when the final vote upon the appropriation was about to be taken and offered the following amendment: "Provided that neither slavery nor involuntary servitude shall exist in any part of said territory except for crime whereof the party shall first be duly convicted."

I remember my father reading that when I was a small boy, and I say I am glad to be with you here because you sent men to represent you in the councils of the nation who have helped to make this country great. There is no man in this country who wears a Grand Army button who does not revere the name of David Wilmot. I went out to the Riverside Cemetery this morning, when taking my morning walk, and looked up the grave of David Wilmot and stood for a while, head uncovered, by its side.

As I look into the faces of these Bradford county people I am impressed with the thought that we want to leave some good with you and we want also to receive some good from you to take away with us, so that we shall feel better in consequence of our coming to your city.

Reference has already been made to the fact that some of your ancestors were from New England and that you have Connecticut blood in your veins, which certainly counts for a great deal, and probably accounts for the progressive Yankee tendency we find in this county. And then too, you have blood from France, from Germany and from England, the best nations of the earth; so why should you not be a good people, and why should we not enjoy this week that is to be spent with you.

And now, Mr. Chairman, if you will bear with me a moment, I will just say a word as to who *we* are. If we may say so without appearing egotistic, we consider ourselves a pretty good kind of people also. We come here to perform a helpful service as educators. The judge has given us a most excellent educational address. He has told us of the necessity of educating the farmer. He has told us of the course of study that must be taken by the lawyer, and he can talk from experience when speaking of the study of law, he has told us of the educational training needed by the physician which of course is apparent to all; but what must a lawyer know in comparison with a farmer? He does not need to know the law, if he knows how to get at the knowledge he needs for each individual case he has to try, when the case comes to him. He must know where and how to find it. What has the physician to do but to keep one being, or animal if I may so speak, going a little longer in the way nature has determined that it should go? But what has the farmer to do? If his animals do not suit him, he must go to work and breed others that will be more satisfactory; if his poultry does not suit his taste he must go to work and improve the breed. Why, only yesterday on my way up here, I read of a proposition to breed hens that will lay red eggs. I should like to see the lawyer, or the doctor, who has a proposition on his hands like that! Why, the farmer to be well equipped for his business must be the best educated man of all. We who are here in this work are not all college-bred men. I see before me some men who are among our most successful Institute workers, who have never been inside the walls of a college as students. They have got their education right out upon the farm.

I remember that about fifteen years ago I was assisting Mr. Piollet, whom I see sitting before me, in holding his farmers' institutes in this county, and one very cold morning we drove about fifteen miles through unusually severe weather. There was a little academy building where the institute was held. I can't recall the name of the town, but I remember the academy. We were nearly frozen when we arrived at the place and we went into a little hotel to get warm. The entire house was cold with the exception of one room, which had a large stove in it. There were several people crowded around the stove and as we came in and were trying to get warm, one young fellow said to another, not knowing as I supposed who we were, "Jim, are you going to stay for the Institute?" "No," replied the other. "What would I want to stay for? Why, those fellows that are coming here are college fellows, and I'll bet they don't know anything about farming. I see that one fellow is going to talk about plowing and I'll bet anything that he never plowed a furrow in his life."

At that point I said, "My good man, I guess you mean me, for it is I that intends to talk upon the subject of plowing." "Well," said he, "Did you ever plow?" And I answered, "I got about half my growth between plow handles." This statement was true then; it isn't true now because I have grown quite a good deal horizontally since that time; it might still be true, if the measure were taken lengthwise, or up and down. "Well" he said, "If you really mean that you have plowed some yourself I shall go to hear you." And so he came into the Institute. When it came my turn, I took up the subject and talked about the manner in which the horses should be hitched to the plow in order that both horses and plowman might perform their work with as much ease and comfort to themselves as possible. I spoke of the manner of adjusting the plow to regulate the furrow-slice and to throw a flat furrow or to stand it at an angle. The method of regulating the depth of the furrow and everything else connected with plowing received proper consideration, and after I got through, the young fellow came to me and said, "Well, I believe now that you have done some plowing and I am glad that I came to the meeting."

My own experience in this matter has been the experience of a great many of us. My friend here, from Lycoming county, Mr. Hughes, and my friend from Lackawanna county, Mr. Northup, and my friend from Clinton county, Mr. Herr, and most of the members of the State Board of Agriculture that are here, got their education just as I did. These are the men who can talk from experience, as well as give to us the theory of this great industry.

Now I have not told you this in order to brag of our work. We did not come here for that purpose. We are somewhat like the Irish girl who, when she went to confession, was telling the Priest her shortcomings and bemoaning her sins and said, "Did you know, Holy Father, that I am engaged to be married?" "Why, no, Mary, said the Priest, "who is the lucky man?" She answered, "Patrick Dolan; and he was over to see me last night, and stayed until after midnight." The Priest said, "That's too long, Mary." "And," she said, "he kissed me." The Priest, willing to have a little fun at her expense, said, "Didn't he kiss you more than once, Mary?" And, quick as a flash, she answered, "I came here to confess, Holy Father, and not to boast." That is our position. We came here to do what we can in the way of helping you along the lines in which you as farmers are interested and not to boast.

The CHAIRMAN: I am going to call on the Hon. A. L. Martin to address us.

Mr. Martin responded as follows:

ADDRESS OF MR. MARTIN

We have been thrice welcomed this afternoon, in these addresses of welcome. The Honorable Judge of the Courts of this county has addressed us in a manner that must, of necessity, give us an uplift in our calling. The President of one of the agricultural societies of the State, and of this county, has welcomed us in an address which arouses enthusiasm on the part of the citizens of this great Commonwealth, who are here represented today; and the chief officer of the town has also welcomed us with a very high tribute. Previous to the selection of this place to hold the meeting, I felt assured that we should meet with a very warm welcome from the people of Bradford county, because for more than twelve years I have mingled with the farmers of this county, and I can think of no one instance in all these years where the Institutes were not fully sustained by the farmers of the county. It is one of the most pleasant parts of my official work when I go over the counties of the State and consider the moral support they have given the Farmers' Institute, hence I am confident that every representative here today is proud and grateful for the privilege of coming to Bradford county to hold this Institute.

And now, my friend, we are proud for another reason to come here, because we are coming to a county which stands among the first in one of the greatest interests along the lines of agriculture—the dairy interest of the State. If Bradford county does not rank first, it is a close second, and I think she is first. I know she stands first in the production of good butter. I do not have the figures of the number of pounds that are produced in this county to supply the United States' Navy. Will some of the gentlemen freshen my memory on that subject?

Why shouldn't the people of Bradford county be proud of their community? I wouldn't give much for people who are not proud of the community in which they live.

Some things have been said here in reference to the political history of Bradford county, that will bear investigation and reflect credit upon the county. It has been my privilege for a number of years to be associated with the members from Bradford county, and they have been an incentive to the interests of agriculture. The worthy Secretary said he was a small boy, but I want you to understand that he was not a small boy in his efforts for agriculture.

During the sessions of this Institute I expect to be called upon to do my part in anything that will contribute to the best interests of this Institute.

I see in the audience a number of gentlemen from whom we shall be glad to hear a word, and I will yield up this time in order to give them an opportunity to speak to us.

The CHAIRMAN: I see in the audience before me a product of our county, Dr. Marshall, from whom we shall be glad to hear a few words.

DR. MARSHALL: I don't know whether to extend a welcome to the visitors, or extend my hand to be welcomed. Bradford county used to be my home, and I like to come back here both as a visitor and a farmer.

I listened to the address of the Judge, and I heartily agree with him in every way. What agriculture needs is education—especially a common school education. I am glad to be here and help the good work along. Whether as a visitor, or as one of your native citizens, I am glad to be here.

The CHAIRMAN: Has any other member anything to say?

MR. KESTER: I have always noticed that the address of welcome and the response is always more or less perfunctory in its nature, but I have felt that the addresses this afternoon were unusually sincere. I would like to have your expression when we leave. We are always very voluble in our expressions of welcome. In fact, I think we are all somewhat like the old lady who was somewhat thrifty, and yet wished to be hospitable; she said, "I like to have people come and visit and take a meal; and I don't mind their staying for two meals; it makes a nice visit; but when they come to stay two or three, or four days, I call that a visitation." I don't know whether our visit will be called a visit or a visitation.

In my work in your county I have always noticed that you are a thrifty people. I think that is because of your New England ancestors. It is a good trait in these days of high cost of living. An old German couple were about to celebrate their silver wedding, and they did not care to have duplicates in their presents, so they had printed at the bottom of the invitation that a jeweller would have a tent on the lawn, where presents could be bought. They had arranged with him that he should have only one article of a kind, and they were to receive ten per cent. of the sales. So it is in some sections of the State; they are not only thrifty, with the old time thrift, but they want a commission also.

I have had the pleasure of being associated in my work with two of the representative citizens of Bradford county, Prof. Card and Mr. Van Noy, men of whom any county can be proud. Down in the southeastern part of the State where the Pennsylvania Dutch hold sway, Van Noy and I spent the winter; we were regaled with the old-fashioned German cooking, and at one place we had five kinds of pie at one meal, and if Van Noy were here, I'd say he sampled them all.

The Judge called attention to the great profession of law, by which and under which we must all live, whether we practice it as a profession or not; but I want to call your attention to the fact that the farmer also works according to law, and a law that cannot be evaded or overcome—the law of Nature, which is greater than any civil law.

The CHAIRMAN: Are there any other remarks?

Repeated calls came for Prof. Menges.

PROF. MENGES: I was asleep.

The SECRETARY: That comes from eating onions.

PROF. MENGES: I was not at your table, Mr. Secretary. I have nothing to say, so perhaps I ought to sit down, but the Secretary gave me an idea about not wanting to be welcomed. I think some fellows would be very glad, indeed, if they were not welcome. I wrote two letters to this place, and I did not get a very satisfactory reply, so I was not sure whether I would be welcome even if I came here. It was a Dutch gang, this gentleman here (Fenstermaker) and myself who came to the hotel, and were met by a very nice-looking gentlemen who shook hands with us very pleasantly, but when I told him I wanted a room by myself, he said he didn't know whether I could be accommodated. However, I held on, and after a while he came and led me to a very nice kind of a place, where I have a room all to myself. So you see it sometimes pays to be disgruntled and make yourself unwelcome.

The SECRETARY: That is the Dutch of it.

PROF. MENGES: Yes, and that is the good part of it. I don't know as much history as the Secretary, but he was once a school superintendent, and he had to know it. I come from a county where they eat pie, and I eat pie.

MR. HOLMAN: You look it.

PROF. MENGES: You don't come from very far away from it yourself. And when the Bradford county fellows are down there, they are worse for pie than we are; we are satisfied with one or two kinds, but these fellows want five or six kinds and then they are not satisfied with one good sample, they want to sample each kind over again.

Now, gentlemen, to be serious, I am glad to be here, and let us make this Normal Institute felt more than it has ever been in the State of Pennsylvania. Institute work is the most important work that can be done in Pennsylvania today. Whatever you may say about the lecturer, the work is the greatest that is being done in Pennsylvania today. It brings the college and the university right down to the farm. It brings hope and help to the man who lives away out there, away from associations such as a man should have; it lifts him up to a higher plane and shows him what is being done in this nation. There are mighty things being done in agriculture today—more than in any other vocation in life. And why do I say so? Go to the United States Congress, and every Congressman who looks a little bit into the future and has his eyes open, is trying to get a bill passed to serve the farmer. Among the most recent bills, is one appropriating $600,000 to employ an expert to go out among the farmers and show them how to do things. Ten thousand of that will come to Pennsylvania, if the bill goes through, and it will go through, and Mr. Taft will sign it, because he is a candidate for re-election.

The SECRETARY: He wants to sign it.

PROF. MENGES: Yes, I think he does, and I should not say that. Now, if a law was passed to send out a lot of expert lawyers, or doctors, or preachers, or anything else, you would have no trouble in finding them; but how about agriculture—the most important of them all? Where will you find them? You could wipe off every other vocation on the face of the earth, and we could get along, but how about the farmer? That is pretty plain talking, and I don't know whether you will like it, but it is true. The farmers are not asking for it, but it is coming. If there is one farmer in the audience who has written a letter to the Congressman of his district on the subject, I wish he would raise his hand.

The SECRETARY: I have written a letter to every Congressman in the State of Pennsylvania. The State Board asked me to do it.

PROF. MENGES: That is the reason you did it.

The SECRETARY: And I want to say right here that I got an answer from every Congressman in the State, saying he would be glad to vote for it.

PROF. MENGES: That is what they should do. Now, I ask it again: Has any one else written a letter? There is another one back there.

Do you know that all the corn raised in the United States today can be raised in Illinois, Indiana, Iowa, Kansas, Nebraska and Missouri? Every bushel can be raised in the corn belt. Do you know that every bushel of wheat raised in the United States today can be raised in the wheat belt of the North-west, without overtaxing the fertility of our soil? And do you know that all the potatoes raised in the United States today can be raised in the State of Maine, and they would have to raise only two hundred bushels to the acre? There is something to be done; and there is another reason why these things are coming. There are thousands of people in the United States today who are going hungry in this land of plenty, where there are possibilities of producing enough to feed the world. In a land like that, people are going hungry; and you tell me that the man who is teaching farmers to do better things, the farmers who are the producers, you tell me he is not an important fellow?

Another thing: There are fellows standing in the way of this advancement. Those of you who read the "Farm and Fireside"—I don't know how many do, but I could recommend you to read several articles that were published on the co-operative societies of the West by E. G. Dunn, Manager of the Co-operative Association of Wisconsin or Michigan—I forget which—but the articles were headed, "How they Whipped Us." It goes on through the difficulties they had to overcome, and tells how finally they got through to Chicago, where they were held up, and that is where they are held up today, by the big terminal elevators. When you ship a carload of wheat from Kansas, Nebraska, the Dakotas, or any part of the Northwest, it has to go through the terminal elevators at St. Louis, or Chicago; sometimes it gets as far as Buffalo and there it is mixed with dirty wheat that comes from the West, and then it is sold as good wheat. A man in the West cannot ship a single carload without going through the terminal elevator, and that is the reason that Patton can raise wheat to $1.15 when he wants to; he buys it at eighty or ninety cents, holds it at Chicago, and the unloads it on you for $1.15. Who pays the bill? The fellow who has nothing to pay with. The Western men beg us to come to their rescue, and we would have nothing to do but to order the carload of wheat shipped direct to New York via the Mississippi River, so that it need not pass through these terminal elevators.

I didn't think I was going to make an address; and I simply want to show you what powerful forces are arrayed against the farmer.

I want to say to you, Mr. Chairman, that I am glad to be in Towanda, and will go home to the Dutch feeling that you people up here know how to entertain just as well as we do down there.

The CHAIRMAN: The program calls for an address by the Hon. Edward M. Bigelow. I am informed he will not be here until Thursday, and I am at a loss to know what to do, but we have with us today a gentlemen whom we are always glad to see—the Agriculturist of the Lehigh Valley Railroad, Mr. F. R. Stevens, of Geneva, N. Y., and I shall now call on him to address us.

Mr. Stevens spoke as follows:

ADDRESS OF MR. STEVENS

Mr. Chairman, and Members of the Farmers' Normal Institute: I want to add a few words of welcome to those already spoken this afternoon. I am glad to see this State Board of Agriculture in this section of Pennsylvania because it is a very good section for agriculture, in the success of which we, as a whole, are very much interested.

The upbuilding of agriculture along the line of this road has been my work, and there we have a common ground. It was a pleasure to me to meet the people at Institutes, and it was a pleasure to have so many of you gentlemen with us, and an honor to me to be allowed to contribute my part to the work in which we are all engaged. I feel very much as your Secretary of Agriculture did. In his address he described the situation exactly when he told about being called upon to take the place of a man who did not put in an appearance, or he would not have been on the program, and as he did, I feel like holding on to the table to keep myself from trembling.

I want to say some things straight from the shoulder, and I want to say them without having a definite address in mind. I want to say to you, because we are working together for the upbuilding of agriculture, we need other methods. Here in Bradford county, a territory with which I am familiar, we have wonderful possibilities. Some men are taking advantage of these possibilities. If you will go a little ways up here you will find what our friends are doing in the growing of fruit. I have been over these farms—some of them. I find that their apple trees and peach trees produce fruit, as much to the acre, of equally good quality with the prize land of the apple belt of Western New York, and yet the land in the Western New York apple belt is sold at from $200 to $250 an acre, and you can buy land in this section of the same kind at from $20 to $30 an acre. I find in this section alfalfa lands that have been made to produce four and five tons to the acre, that could be placed beside any other alfalfa land in this or any other section. I find land back over the hills, ten or twelve miles from here, land that is largely A1 potato land—land that in Maine would bring $150 per acre, and yet here it is selling cheap. I find here dairy herds, similar to the best we find anywhere else, 50% of which are kept on the land, and we find people here who insist that dairy herds do not pay. Friends, we are in a prosperous agricultural section, and yet you will agree with me that these things are true.

Now, then, the work of draining these lands so that they will produce a hundred and twenty-five bushels of corn to the acre; that it will produce three hundred bushels of potatoes to the acre; that it will produce five tons of alfalfa to the acre, as has been done within ten miles of Towanda the past year. The selection of our dairy herds so that each cow will show a profit; the tilling of the land so that it will produce a profit of a thousand dollars an acre, instead of thirty dollars an acre—to show these men how to do this, is your work and my work, but how to do this is what we must discuss. If I am to be permitted a moment, I want to emphasize some things.

We have too many agencies for work, and these do not co-ordinate. To be explicit, we have our State College doing extension work. I am not referring now to the work being done within its walls, but to the extension work. They are doing this work well. The State Department of Horticulture is giving instructions in the growing of orchards, and it is doing well. The Farmers' Institute Bureau is conducting a series of Institutes up and down the State that are first-class in every respect, and that work of extension is being done very well. The railroads have also taken up the work, and they are doing the best they can to aid the State in its work. The great work that lies before us is to unite these forces, so as not to work at cross-purposes; so as to avoid spending money uselessly, because we have none to spend in that way. The time has come when these things should be taken up—when we should work as a unit in the State. At least this is my judgment. It seems to me that co-operation should begin at home. It seems to me that in agricultural extension this co-operation should be first considered.

In addition to what I have said, let me add: The State College is not being supported as it should be. It should be the work of this body, in my judgment, to take hold of this fact, and work to secure additional appropriations for the building up of our college, for it is the institution from which most of our agricultural education is received. The State should be called upon to appropriate money sufficient to support these schools, as is being done in New York State.

One other thing: This body of men and the corporation I represent here this afternoon should work together, and so far as I am concerned, I want to say that we are willing to do all in our power to bring about a relation between the producer and the consumer which will do away with the conditions that Brother Menges mentioned this afternoon, and we want to do away with every possible obstruction that stands between the producer and the consumer, except the factors that are absolutely essential.

My friends, I came up here to speak directly of some things I have had on my mind for some time, and I feel better since they are off my mind.

I want to make a further suggestion: That the Board of Agriculture appoint a committee to confer with us and see if some of these things cannot be brought about. I would like to have some member of the Board formulate it in his mind, and then put it in the form of a motion. I am not a member of the Board, so simply make it as a suggestion that some member make a motion that such a committee be appointed with authority to represent this body, to confer with other agricultural bodies, and we will do all in our power to bring about these conditions.

The SECRETARY: If Mr. Stevens will just wait a minute, I want to ask him a few questions. I have been thinking of some of these things for some time, and I have thought that possibly this would be a good move: That the State Board of Agriculture appoint a committee to confer with the State Horticultural Association, State Dairy Union, Livestock Breeders' Association, State Poultry Association, Beekeepers' Association, and any other agricultural association and they devise some plan of co-operation. And my thought has been that when we appear before our State Legislature as a committee from the allied agricultural interests, it will make an impression that cannot be secured in any other way. You have asked for suggestions, and that is the line along which I have been thinking. How does it strike you?

MR. STEVENS: That expresses it, Mr. Secretary. I am very glad you have taken it up. I have felt very deeply along this line for some time, and I think it is time we should do more than talk about it. The State is not over-liberal in its appropriations to agriculture—is not over-liberal toward the College, and it is necessary that we should unite all forces working toward the same end and see if we cannot get better results.

The SECRETARY: And they should do the work together?

MR. STEVENS: And we should all work together. If I am to be permitted, may I ask if any one else has any suggestion along this line?

DIRECTOR MARTIN: I would simply say that the suggestion as outlined by our Secretary has been considered in my own mind for some time, and as the State Board has arranged for an extra session in connection with the Normal Institute, I see no reason why this committee should not be appointed at that meeting, and we can also appoint a Committee of the Institute workers to work in conjunction with it. If there is no objection, I will say that a way will be made for the State Board to hold its extra session on Thursday morning.

The CHAIRMAN: Thursday will be a pretty busy day. Could not this meeting be held on Friday?

The SECRETARY: The Secretary will not be here on Friday; how would Wednesday afternoon do?

DIRECTOR MARTIN: It will be pretty busy, but I think it can easily be arranged for Thursday morning as well as any other time.

MR. HOLMAN: I would like to ask Mr. Stevens a question. You have explained the nature of your work; now tell us how you do it.

MR. STEVENS: My work I can explain in very few words. It is the development of farming all along the line of the Lehigh Valley Railroad. The prosperity of the railroad is dependent upon the prosperity of the people living along its lines. My work is to help the farmer along his individual lines—in the development of his pet schemes—to help him individually. Individuality is all that counts most in every man.

MR. HOLMAN: Does the man come to you, or do you go to the man?

MR. STEVENS: Not altogether that way. I go to the Institute meetings, and the Grange meetings, and so on, and a man who has any difficulties writes them on a slip of paper and hands them to me, or he drops me a card, and then I take my auto—the railroad provides me with one—and go out to his farm, and we sit on the fence and talk it over.

DIRECTOR MARTIN: I wish to call your attention to the program for Wednesday morning: Mr. D. A. Knuppenburg will be the Chairman, and there will be an address on "The Care and Management of the Orchard" by Mr. F. H. Fassett, who has made a great success of his own orchard. This will be followed by an important talk by Prof. Van Norman on the "Feeding and Management of Dairy

Cows." This last number should be particularly interesting to the people of Bradford county, where the dairy interest is such a large one.

MR. JOEL A. HERR: Mr. Chairman, this has been sort of an experience meeting, and we all know that experience is the most valuable thing a man can have. The kernel of it is that a man must love the business he is engaged in, and that love must draw us into a deeper interest in the work in which we are engaged. In travelling over the country I look out of the car window and see fine buildings, and good silos, and evidences of thrift and I say to myself, "That man has been to some school and is putting his theories into practice" He heard something about feeding, and began to put it into practice; then he gets another cow or two and finds his theories work out; then he begins to build his silo. This man loves his work, and takes an interest in it, and it leads him right along to prosperity. After he gets his silo in shape and his herd producing, he is lead on to study the fertilizer question so as to get his soil in good condition. Then he adds more stock, and everywhere we see the result of the work of the schools of agriculture.

Now, I suggest that our institute workers take up this question, and talk of the possibilities of developing an interest in agriculture. A man who does not love his occupation—and I don't care what it is had better get out of it. Get the boys of the farm interested in some special line, and once a boy becomes interested, he will learn to like it and go forward and study it, and learn all he can about it, and by and by he will develop into a prosperous and successful man. I have seen a great deal of that in going over the country. If you see a silo, the next thing you will see a good alfalfa growth, because it is a cheap feed, and a good one, and an easy one to grow. If we can get our institute people interested in these things, then we will have successful institutes. It afforded me a great deal of pleasure to know that during the last season the people would crowd around the speaker and ask him questions. I noticed that especially in connection with Dr. Detrich in Clinton county.

PROF. MENGES: May I say just one word? I have talked enough this afternoon, but I want to make a suggestion. This kind of work was inaugurated a little over a year ago at a meeting held by the Institute workers at State College. We recognized the fact that we must have more money. We recognized the fact that we cannot afford to have any conflicts in our work. We also recognized the fact that if there is any conflict, the fellows who appropriate the money soon find it out.

Then there is another thing: There are none of the County Chairmen with whom I came in contact last year, of whom I did not request that he appoint or select a number of men in his county to meet the State Legislature at Harrisburg whenever the Secretary or the Deputy Secretary shall ask for them to come there, in in order to carry through the appropriations that we have been talking about this afternoon. Now I know very well that when a set of men like we are, assembled here this afternoon, tell the Appropriations Committee what they need, there is no trouble in getting it. We must know first what we want, and I think we should know it so definitely that there is no chance of having it miscarry in any shape or form.

MR. KESTER: We must be prepared to answer any question that may be raised. And not only that; when this bill referred to by Prof. Menges becomes a law, it is a question whether our Legislature will not have the idea that this work is to supersede the work of the four agencies already in the field. Now in order to overcome this idea, we will have to do away with the multiplicities of the work as it now is, and appear before that body as a united force to impress upon them the work that still remains to be done even if this Federal Bill passes and becomes a law. If this $10,000 is duplicated it will eliminate to some extent some of the extension work, but it will by no means cover the whole field, and it is necessary for us to be able to show these facts to the Legislature.

PROF. MENGES: It will not become effective until 1914, I believe.

MR. STEVENS: But all these agencies should be united and worked toward one end.

DIRECTOR MARTIN: They can work along this one line in perfect harmony.

A Member: I will not detain you: I simply want to call your attention to a plant that I have brought with me; you will find it on the stage, and I shall be glad to have you look at it after the close of the session. It is known as the Bulgarian or Sweet Clover, and should be more extensively known than it is.

MR. SEAMANS: At the meeting this morning a motion was made and carried that a committee of three be appointed to act with the Secretary in reference to the credentials of members of the Board. I wish to announce that I have appointed on this Committee, Messrs. S. S. Blyholder, Matthew Rodgers and P. S. Fenstermaker.

I will also announce that there will be a meeting of the State Board of Agriculture at this place tomorrow at nine o'clock.

The CHAIRMAN: Anything further? If not, it is time to adjourn. Mr. DeWitt will preside this evening, and the program is as follows: "Organization for Soil Efficiency," by Dr. Thomas F. Hunt, of State College, and "The Farmer and the Chestnut Blight" by Prof. Samuel Detwiler, of Philadelphia, who is at the head of the Chestnut Blight Commission.

We will now stand adjourned, until 7.30 this evening.

Towanda, Pa., Tuesday May 21, 1912, 7.30 P. M.

Mr. C. H. DeWitt in the Chair.

The CHAIRMAN: The Institute will come to order. I received a notice about two weeks ago from our Deputy Secretary that he wished me to preside this evening. Now, my friends, I have but little experience in presiding at any meeting, but I will do the best I can. I wish to say, before we start this meeting, that this is the second Institute of the kind I have ever attended. I wish to say that I have been very much pleased so far today. There have been some good things brought out, in my judgment, and I have been pleased with the hospitality of the town. While I belong to a county adjoining, and feel very proud of my county, and of my county-seat, I was privileged this evening to be taken around this village in a carriage, and I wish to say to you that I was very much impressed with the town, and with the handsome residence buildings in this place. I didn't know that Towanda was so nice a place as it is. I say this without any boast on my part. I think we have a nice county-seat in Wellsboro, but I must say you certainly have a beautiful place, and I do not wonder that you people with whom I have become acquainted, like to live here.

The first subject on the program this evening is a lecture by Dr. Thomas F. Hunt, Dean of the Experiment Station, State College, on "Organization for Soil Fertility." Dr. Hunt will now speak to us.

Dr. Hunt spoke as follows:

ORGANIZATION FOR SOIL FERTILITY

By DR. THOMAS F. HUNT, State College, Pa.

Mr. Chairman, Ladies and Gentlemen: Since I agreed to write this paper on Soil Fertility, something happened to me. Had it happened to me before I promised to write this paper, I fear I should not have presented it. As a matter of fact, since this thing happened to me, I have been almost ashamed to look a farmer in the face. Now, what happened to me was this: I took a vacation of thirty days, and during those thirty days I drove practically every day, barring Sunday, in a horse and buggy through the State of Pennsylvania. I was brought up in a one-room schoolhouse out in Northern Illinois, and I learned about the Andes, and the Rocky Mountains, the Himalayas and the Appalachian Range, and they all looked alike to me, and I have never gotten out of my mind that childish presentation of the Appalachian Chain; I have never fully gotten out of my mind the childish imagination, that I know a great many people outside of Pennsylvania have, that a great deal of Pennsylvania consists of large mountain ranges running across the State. So I started out to drive from State College to Morrison's Cove. Now, to my childish imagination, Morrison's Cove was a little bit of a narrow place, through which we could drive in a very short time. As a matter of fact, I spent three days driving through Morrison's Cove. It was not a little bit of narrow cove, but a big farming valley. I drove from Bradford to York county, and then on. Instead of mountains I found valleys filled with beautiful farm lands, and I never before have seen such good farm lands; never before have I seen such uniformly good farm homes. In all that thirty days' drive I saw but two places that made my heart ache because people lived there. And now do you know why I am ashamed to look a farmer in the face? Because I wrote bulletins teaching these people how to farm, and from the looks of things, they were practising all the things I wrote before I was born—and some one told me that was the reason they were good farmers.

A great deal is heard in these days about methods of selling farm products. Co-operation and credit are being widely discussed in their application to farming.

The United States Department of Agriculture has announced that for every thirteen dollars a consumer pays for farm products, six dollars is received by the farmer.

A year ago, I brought to your attention the fact that at Freiburg, Germany, the farmer could come to town by train with his produce, a distance of ten miles, for less than the price he could obtain for three pears. Recently, some time was spent among the farmers of York county. For a distance of ten miles from the City of York, a town of about 45,000 inhabitants, the farmers attend market. They work on their farms five days in the week, and on the sixth day they go to town to sell their produce. There is a saying among them that if a man attends market he always has some money: that if he does not he never has any. This section of Pennsylvania is quite hilly, the land is only moderately fertile, but the improvements upon these farms are uniformly good. It is a community of prosperous, home loving, God fearing people. A very important element in their prosperity is the fact that the farmer secures the last cent that the consumer pays. He does not divide his profits with the broker, the commission man, the wholesale and retail merchant.

York county is typical of many other communities. The importance of the illustration lies in the fact that it is now new. The practice is generations old in the United States, and centuries old in other counties. There are, however, many communities where the practice does not obtain which could well adopt this simple method of bringing the producer and consumer together. The method simply consists of being a farmer five days in the week and a merchant on the sixth day. The results of the sixth day should contribute to a peace of mind on the seventh.

The question of selling has an indirect bearing upon organization for the purpose of maintaining the fertility of the soil. When corn is worth thirty cents, wheat sixty cents, and oats twenty cents a bushel and hay five dollars a ton, the increase from use of commercial fertilizers will not sell for enough to pay for them. If, however, corn is worth fifty cents, wheat eighty cents, oats thirty-two cents, and hay ten dollars a ton, the thirty years' experiments of The Pennsylvania Station indicate that profitable returns may be obtained from the use of commercial fertilizers, if they are purchased at ruling prices. If, however, twenty dollars is paid for a fertilizer whose ingredients should have been purchased at ten dollars, these same experiments indicate that at prices last named no profit would be obtained.

The Pennsylvania Experiment Station recently received a letter from a citizen of Pennsylvania that he was being offered a fertilizer at $21.00 per ton which was said to be a high-grade fertilizer worth $30.00. The Experiment Station had recently purchased its supply of fertilizers from a local dealer. The ingredients in the ton of fertilizer above mentioned cost the Station $9.50.

It is true, of course, that the Experiment Station had purchased in larger quantities than the average farmer needs and had by competitive bids received, doubtless, a wholesale price. The fact remains, however, that if the Experiment Station had been compelled to pay the price for its ingredients that was asked in the above mentioned $21.00 per ton fertilizer, there would be no profit in using the fertilizer, there would be no profit in using the fertilizer at the prices of farm products above mentioned. At this Station, the value of the increase in the products at prices mentioned has been about twice the cost of the fertilizers applied. Double the price of fertilizers and all profit disappears.

It is evident, therefore, that an essential element in the maintenance of soil fertility in Pennsylvania is to so organize the distribution and sale of commercial fertilizers as to enable the farmer to secure them at a price which will make their use profitable. These statements are not intended and do not in any way reflect upon the legitimacy or business integrity of any of the agencies now engaged in the distribution and sale of these goods.

Although it may see a digression, I desire here to call attention to the sale and distribution of lime in this State. The men who have been studying the condition of the soils throughout Pennsylvania express the conviction that a considerable portion of the area is in need of liming. Generally speaking, those portions which need lime most are farthest removed from deposits of limestone. The cost of transporting lime becomes in these localities a serious question. The transportation agencies have been approached with regard to a low freight rate. Their reply is that they would be willing to consider a low freight rate on raw ground limestone, provided that the State would pass such laws as would guarantee that the purchaser was getting a satisfactory article. They say that their only object in giving a low freight rate would be to cause the farmer to raise better crops. If they furnished the farmer ground material that was not calcium or magnesium carbonate, then their object would be defeated.

They are not willing to give a low rate on burned lime because the privilege would be abused by those wishing to use lime for building purposes. I am bringing this subject to the attention of the Farmers' Normal Institute believing that it is a matter of importance, and one upon which this organization might wish to express an opinion.

In any country, land that has once been fertile can be brought back to a productive condition profitably when the price of the products raised bears a certain relation to the cost of plant food. This condition now obtains in Pennsylvania. According to the thirty-year results of your Experiment Station, it appears that it is possible to maintain the fertility of the soil without diminution for any number of generations as long as the price of farm products and fertilizers remains at the average level of the last fifteen years. It should be stated that these experiments have been conducted on a naturally well drained limestone soil. This soil, therefore, has what some soils lack in Pennsylvania, namely, good drainage and a fairly abundant supply of lime. Similar fertilizer experiments have been conducted at the Ohio Station, on a soil that lacks good natural drainage and is deficient in lime. The results of the Ohio Station show that when these defects are remedied that such soils respond in like manner to the use of fertilizers. The Pennsylvania experiments were made upon the Hagerstown series of soils, which are typical of the limestone valleys of Pennsylvania; while the Ohio Experiments were made upon the Volusia series which covers most of the northern third of Pennsylvania, southern third of New York State, and portion of eastern northern Ohio.

If there is anyone lesson that the results of these two stations enforce, it is that in order to maintain the fertility of the soil profitably it is necessary to organize some system of farming. It is necessary to till, to tile, to lime, to manure and to fertilize with reference to the crops and with reference to the succession of crops.

These experiments do not show how much yard manure, phosphoric acid or potash may profitably be applied to a particular crop, such as corn, oats or wheat, but they do furnish some indication of what applications of yard manure, phosphoric acid and potash should be applied during one rotation, so that at the close of the rotation the land will be as productive as when the rotation began.

Another and very important lesson of the Pennsylvania experiments is that on land that is well drained and contains plenty of lime, it is possible by the addition of low-priced mineral fertilizers—phosphoric acid and potash—to keep the soil supplied with nitrogen by growing clover once in four years. It seems well established that it is possible to so organize a farming system that it will not be necessary to buy any nitrogen in commercial fertilizers in order to indefinitely maintain the fertility of the soil. It does not follow from this statement, however, that it may not be profitable to do so. On farms carrying a limited number of livestock, the use of nitrogen with phosphoric acid and potash for the production of timothy may be very desirable.

The farmer has three principal sources of nitrogen, viz., clover and other legumes, the liquid portion of the manure and commercial fertilizers. Nothing is plainer than that the farmer should so organize his farm as to exhaust the possibilities of the clover and the liquid portion of the manure before resorting to the purchase of nitrogen.

One of the factors, therefore, in maintaining the fertiltiy of the soil is to so organize the system of management that all liquids are returned without loss to the soil. The details may vary, but in general it means plenty of bedding and the protection of the manure from the weather until it is drawn to the land.

The idea is as simple as simple can be. How many people practice it?

Another lesson and one very much needed, which these experiments show, is that there is nothing injurious about commercial fertilizers. For thirty years, certain plats in this experiment have received no stable manure. No organic matter has been added to the soil, except that which was furnished by the roots and stubble of the crops grown. These plats are not only as fertile as they were thirty years ago, but they have yielded and continue to yield as good as adjacent plats which have received yard manure every other year in place of commercial fertilizers. Here emphasis should be placed upon the fact that these results were obtained in a four-year rotation of corn, oats, wheat, and clover and timothy. Thus every fourth year a good strong sod of clover and timothy has been turned over for the succeeding corn crop. If in place of plowing this heavy sod once in four years, the field had been mown for a number of years until the hay was no longer worth cutting and the soil had lost the abundant supply of roots, the result would undoubtedly have been different. One of the important factors in maintaining soil fertility is the plowing down of a dense thrifty sod at regular intervals. It is the nearest approach to a virgin soil that we know how to produce.

While the lesson is perfectly clear that it is entirely possible to maintain the fertility of the soil by the use of commercial fertilizers alone, it is no less certain that it is neither good farm management nor good public policy to organize a farm for the growth of the staple farm crops without including in the system domestic animals to consume a portion of the products raised.

A farm should be so organized as to make the most economic use of the crop residues. Under such conditions, it will ordinarily be necessary to supplement the manure made upon the farm with purchased fertilizers. The matter resolves itself down then to a question of rotations with a suitable combination of yard manure and commercial fertilizers.

Upon this basis, I venture to suggest the best judgment of the Station as to methods of fertilization which will maintain the fertility of the soil and at the same time give profitable returns during a series of years, at prices which have ruled during the past fifteen years. It should be noted that the suggestions here made cannot be said to be demonstrated by the thirty-year experiment. The results of these experiments have been published from time to time and can be secured by anyone who may desire to study them. What is proposed this evening is to venture some opinions as to the direction in which these experiments point. It is intended merely as a guide for those who wish to apply the results of long and systematic investigations on the subject of maintaining soil fertility. Like any other prescription, it will need to be modified to meet the needs of the patient.

The following table suggests several rotations:

TABLE SHOWING METHOD OF FERTILIZING CROP ROTATION.

3 yr.	4 yr.	5 yr.	7 yr.	
--------	--------	--------	1	Corn: 6 to 10 loads of manure and 25 pounds of phosphoric acid.
1	1	1	2	Corn: 6 to 10 loads of manure and 25 pounds of phosphoric acid.
--------	2	2	3	Oats: No fertilizer.
2	3	3	4	Wheat: 50 pounds each of phosphoric acid and potash.
3	4	4	5	Clover and timothy: No fertilizer.
--------	--------	5	6	Timothy: 25 pounds each of nitrogen phosphoric acid and potash.
--------	--------	--------	7	Timothy: 25 pounds each of nitrogen, phosphoric acid and potash.
--------	--------	5	6	Timothy: 25 pounds each of nitrogen, phosphoric acid and potash.

Four rotations have been outlined. There is a seven-year rotation consisting of corn, two years, oats and wheat each one year, and hay three years. It is obvious that a six-year rotation could be obtained by omitting corn one year or hay one year. By omitting corn and hay each one year, the five-year rotation would be obtained. The thirty-year fertilizer experiments contain the same four-year rotation as the one here out-lined. No plat in these experiments has been fertilized as here suggested, but several have approximated it sufficiently and make it reasonably certain that the method here outlined for a four years' rotation would indefinitely maintain the fertility of the soil if the land is well drained, either naturally or by means of tile. and the land is kept properly supplied with lime. In the three-year rotation, the crops may be corn, wheat and clover, or corn, oats and clover without in any way modifying the fertilizer. The Experiment Station has been having most gratifying results in using the three-course rotation of corn, wheat and clover in building up run down soil, without manure, using commercial fertilizers on both corn and wheat. when no manure was used on run down soil, eight to ten pounds of nitrogen per acre were added to the fifty pounds of phosphoric acid and potash. The quick response to this method of fertilization was doubtless due in part to the two applications within five months, in May for the corn and in September for the wheat. When manure is available for corn, and is supplemented with phosphoric acid, even better results should be obtained.

A few propositions may be laid down categorically, as follows:

It is not good farm practice to use a commercial fertilizer containing a single fertilizer ingredient, except as a supplement to stable manure. Stable manure on the other hand should be supplemented with phosphoric acid in order to balance the relative excess of nitrogen and potash.

The amount of potash that should be applied to soils in Pennsylvania in connection with phosphoric acid will depend upon the amount of hay, straw and other crop residues that are consumed on the farm. If the domestic animals are fed largely upon hay and silage and bedded heavily with straw, less potash will be needed than if hay is sold and bedding is used sparingly. Hay, straw and other crop residues contain a relatively high percentage of potash and a low percentage of phosphoric acid. In grain and other concentrates, this condition is just reversed.

Where both yard manure and commercial fertilizers are employed, it is probably best to apply the manure for the corn and the fertilizers for the wheat. Lime, phosphoric acid and potash are essential to a vigorous growth of clover.

Corn should not be grown in Pennsylvania on land that does not overflow without either an application or manure or commercial fertilizers. If sufficient yard manure is produced to cover two-sevenths of the cultivated area annually, then corn may be raised two years in succession in a seven-year rotation. If yard manure is lacking, then commercial fertilizers should be employed adding ten pounds of nitrogen to fifty pounds each of phosphoric acid and potash.

No hay field in Pennsylvania, unless it overflows, should be cut more than one year without the application of fertilizers. The evidence seems fairly conclusive that there is no ordinary stable crop where commercial fertilizers will bring a larger return than on grass lands.

More important even perhaps is the fact that herein lies the most efficient and economical method of building up the fertility of the soil. As previously stated, an essential feature of the maintenance of soil fertility is the plowing down periodically of a thrifty, vigorous sod. One of the weakest points in the system of farming in some sections of Pennsylvania is the fact that the hay fields are mown until the grass becomes thin and the roots have largely disappeared, so that both organic matter and available plant food has been decreased instead of increased as it should have been.

If sufficient yard manure is available, equally good, if not better, results may be obtained by using manure as a top dressing in place of commercial fertilizers. In some cases, indeed, it may be good practice to use the yard manure as a top dressing for the hay fields and apply the commercial fertilizer to the overturned sod for corn.

Director Brooks has probably studied the problem of growing grasses longer than any other Station Director in America. His Station probably has more experimental data bearing directly upon the production of hay and pasture than any other Station in this country. Doctor Brooks in a carefully prepared public address recently stated that there were soils in Massachusetts which would be worth $300.00 an acre on which to grow grass when hay was worth twelve dollars per ton.

In order to secure a return which would justify this capitalization, he recommended an annual application of forty-five pound of nitrogen, twenty-five pounds of phosphoric acid and fifty pounds of potash. The Pennsylvania Station, however, following the results largely of the Cornell Station, is recommending the application of twenty-five pounds each of nitrogen, phosphoric acid and potash. This is equal to the application of 350 pounds of a 7-7-7 fertilizer, or 400 pounds of a 6-6-6 fertilizer. The complete fertilizer as usually prepared is relatively too low in nitrogen and potash and too high in phosphoric acid to secure the best results when applied to grass.

The quantities above mentioned, viz., twenty-five pounds each of nitrogen, phosphoric acid and potash, may be obtained approximately by mixing 150 pounds of nitrate of soda, 150 pounds of phosphoric acid and 50 pounds of muriate of potash.

Not quite one-fourth of the farms in Pennsylvania are operated by tenants. This fact has an important bearing on organization for soil fertility. If the land is to be built up or even simply maintained by means of a five-year rotation, the full effect of the fertilization, which was given to the corn crop in the first year of the first rotation, will be obtained until the last hay crop is harvested from the second rotation in the tenth year. In the fertilizer experiment at the Pennsylvania Station ample returns have been obtained from the use of both yard manure and commercial fertilizers, taking an average of thirty years even at prices of products considerably below the present level. During the first ten years, however, there was not adequate return from either manure or fertilizers, except in the potential possibilities of the soil. The tenant is interested in the very immediate present.

The most important reason, however, for the depletion of the fertility of the soil of rented farms grows out of the necessities of the landlord.

Investments in farm property follow exactly the same laws as investments in stocks and bonds. The greater the security the less the return: the greater the returns the less the security.

The normal condition is that of a man with an investment of ten to fifteen thousand dollars retiring to town at the age of sixty to seventy years. This man, like all small investors, desires to secure the largest possible dividends. Not content with four to five per cent., which would keep his principal secure, he is anxious to secure if possible eight to ten per cent. He is like an other so-called "wild cat concern" which uses its principal with which to pay dividends.

The exigencies of the small investor in land has dominated the leasing system. It is true that the renter is willing to rob the land. He can do so only when he is permitted to do so, and will do so only when the terms of the lease make it to his financial advantage. Unfortunately, the system of leasing which the landlord has found will pay the largest dividends for the time being is the system which makes it to the renter's interest to deplete the soil.

It is possible to draw the terms of a lease so that a farm of depleted fertility may be built up, or the crop-producing power of a fertile soil may be indefinitely maintained. To bring about this result, it is only necessary to so draw the lease that it is to financial advantage of the tenant to practice good husbandry and to his disadvantage to practice poor husbandry.

Messrs. Foley and Smith, of the United States Departmenof Agriculture, have reported an interesting illustration of this principle, which has been in operation for thirty years in Maryland.. * This particular instance is noteworthy because of the long period of time the system has been in vogue, and because it involves 56 farms, averaging about 280 acres each, or in the aggregate about 24 square miles of land.

The two important features of the system are the rotation of crops and a certain requirement of the lease. The rotation if five years, consisting of corn, wheat or oats, clover, wheat, clover. The important requirement in the lease is that the tenant may sell the hay, straw and stover if he chooses to do so, but in such case he must share the proceeds equally with the landlord. If, however, the tenant chooses to feed the hay, straw and stover to livestock, he shall be entitled to all the proceeds from the sale of livestock or their products.

These are two extremely simple provisions. They accomplish very important results. This five years' rotation results in two crops of clover in place of one in the ordinary five years' rotation.

Inasmuch as the clover is sown in the wheat or oats of the previous year, clover is grown on four-fifths of the farm every year. The only field which does not have clover growing upon it is that one that is in corn and is receiving tillage. This arrangement guarantees to the soil the nitrogen necessary to raise maximum crops.

In order to secure the largest return under this lease, it is necessary to adopt some system of animal husbandry. The tenant, however, is entirely free to choose any system of animal husbandry. He may practice dairying, raise beef or horses, or specialize in mutton and wool. He may keep livestock enough to feed up the roughage or he may feed his own corn or even purchase concentrates.

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*U. S. Department of Agriculture, Farmers' Bulletin No. 437.

There are other details. It is my purpose merely to point out these two simple and essential features which might be made a part of any lease. To repeat, the essential features are a rotation which supplies nitrogen to the soil, and a lease which requires the tenant to practice good husbandry in order to get the greatest financial advantage from it.

What have been the results in the instance above cited? There are three persons or classes of persons interested, viz., the tenant, the landlord and posterity.

The fifty-six tenants are permanent because the lease is a favorable one. They live in good houses. They educate their children well. Many of them have bought other farms which they rent.

The records for thirty years show that the fertility has been maintained fairly well. The yield of corn on these estates has been higher than that in Iowa. The yield of wheat has been higher than that in Kansas. The yields, however, have not been unusual. They have not been what they might be made with more intelligent fertilization.

The landlord is estimated to have received during thirty years from this twenty-four square miles of land about 54% on his investment. In the meantime his land has so increased in value as to make the total interest on the investment between eight and nine per cent.

The organization of the tenant farm is one of the most important problems in connection with the maintanence of soil fertility in Pennsylvania. The writer would urge upon the Institute speakers that, if they have not already done so, they study carefully and with an open mind the whole problem of tenant farming, and that they make it a prominent feature of their institute discussions. It is not a subject to be handled lightly. It requires deep study, and unprejudiced mind, and a willingness to say some things frankly.

Some time ago a graduate of the School of Agriculture of the Pennsylvania State College, who had just been employed to manage a farm, came to the office to discuss some questions of organization. A sheet of paper was passed across the desk on which he read the following:

"Mr. T. E. Martin, Rush, N. Y., is one of the most successful potato growers in the United States. He has a farm of 57 acres of the Dunkirk series of soil. He has three 18-acre fields in a rotation consisting of potatoes, wheat and clover and alfalfa. Mr. Martin has increased the yield of potatoes from 60 bushels per acre in 1892 to 417 bushels in 1906. In 1906, he produced 7,510 bushels on 18 acres. In 1907, he sold $2807.89 worth of potatoes from 18 acres, or $160.00 per acre. He attributes his large yields mainly to drainage, through preparation of the soil, good tillage, spraying, clover and alfalfa, manure and commercial fertilizers."

"Huh," said the alumunus, "that is about everything."

The philosophical editor expressed very much the same idea while walking over the experimental field of the Pennsylvania Station, when he remarked "Every farm should raise a field of alfalfa. It is a liberal education."

Keeping up the fertility of the soil means doing about everything. It means practicing good husbandry. The Pennsylvania Agricultural Experiment Station believes that the results of the thirty years' fertilizer experiments justify the belief that it is possible under existing prices for the fertilizers and farm products, to maintain economically the fertility of the soils of Pennsylvania indefinitely, provided they are well drained, contain plenty of lime and good methods of husbandry are practiced, and provided further the soil is now fertile or was once fertile.

Land that was never fertile is excluded from this discussion.

MR. STOUT: Mr. Chairman: It has been suggested that if there are any questions, we should write them out. If these are handed to the doctor, will he answer them? According to report of the Massachusetts Experiment Station, the use of raw bone meal is not profitable in comparison with dissolved phosphate. The proportion of crop products in three year tests, the yield of bone was equal to 17 lbs. of crop, compared with a hundred pounds of crop by dissolved phosphate. Please give your opinion.

DR. HUNT: I don't think the Pennsylvania Experiment Station has made any actual experiment on this very important question. The Pennsylvania Station conducted for twelve years some tests in reference to bone meal, rock phosphate and acid phosphate, but it was found as the result of these experiments that the character of the phosphate did not materially affect the result, where the manure was used alone. On the other hand, the last experiments made at the Ohio Experiment Station by Director Thorne, where he has used rock phosphate and acid phosphate with the manure, is to the effect that the acid phosphate gives rather better results. In our experiments, a low grade of ground meal gave us most excellent results. I don't believe the last word has been said on this subject. I want to say to your farmers that when I say they get good results with acid fertilizer, I mean to say that this is so because we have used it. We have not used rock phosphate enough to know just what the result will be. I think the farmer will get results with rock phosphate, but I am not prepared to say how good, because we have not investigated it sufficiently to give the farmers of Pennsylvania positive information on that subject. Since I have been in the State, we have not had money enough to conduct experiments as we should. That is the best information I can give you.

MR. WOODMAN: Dr. Hunt, you said that commercial fertilizer gave better results when applied to grass land then anything else?

DR. HUNT: I am inclined to believe it. I think in a crop rotation I would use the manure on the corn; if you have plenty of manure, use it by all means.

MR. WOODMAN: I get better results by using the manure on the grass and applying the fertilizer to the corn.

DR. HUNT: There can be no objection to that.

The SECRETARY: If you were going to plow that land down for corn the next year, could you not apply it when you made your hay?

DR. HUNT: It becomes partly a practical question. If you get time, you apply it in the summer or fall, but your manure is made largely in the winter, and you apply it when you have it. If you save it until the next summer and apply it then, the manure will not be the same as to character, so it becomes largely a practical question; it also involves the time of the hauling the manure, so it resolves itself largely into a practical question.

MR. SEEDS: Do you use the same kind of commercial fertilizer on clover as on timothy?

DR. HUNT: I have not advocated the use of any on clover. If you look at this chart you will see that. You can get a first crop without the use of any fertilizer, but if you apply manure to the corn and fertilizer to the wheat—the corn is to be there but one year. If you are going to keep it there any longer, you will have to plow down a dense sod before you make it, unless you fertilize.

MR. GOODERHAM: We are interested in this question, and I think it would be well to take up the matter of freight on manure as well as on lime. I went into the city to get some of the manure the stables were trying to get rid of, but found that the rate of freight from Pittsburg, one hundred and fifteeen miles away, made it impossible to get it. I don't see why this should be.

DR. HUNT: I did not know that this question had come up, important as it is.

MR. STEVENS: I would like to take up this question of lime. So far as I know, in the East ground limestone has not been put at a price that the farmers can afford to use it. When the time comes that the East can put out this lime stone at the same price as the Middle West, the railroads will do their part.

DR. HUNT: It is desirable that the railroads shall be sure of the fact that it is a pure ground limestone; otherwise it would be a loss to the farmer.

MR. STEVENS: Yes, sir; but recently I was authorized to offer a certain rate on ground limestone, provided it would be guaranteed that it was ground limestone. This the shipper would not do. Of course the deal was off. Then take the matter of manure. I went into the matter with the railroad and they were willing to make a rate, but the Intercommercial Committee had a rule that our cars must be thoroughly cleaned and fumigated before they could cross the State line. You will therefore see how prohibitory it is if the manure has to be taken out of the car, and the car cleaned and whitewashed and the manure reloaded, in order to get it across the State line. It is not the railroads that are arbitrary about it.

MR. GOODERHAM: Would that apply to the State?

MR. STEVENS: I can't say what the local conditions are. That refers to the interstate rate. In shipping from Jersey City, the manure must be taken out of the car, and the car fumigated at Phillipsburg, before it is allowed to cross into Pennsylvania. I cannot see the reason for it, but it is a matter over which we have no control.

MR. KESTER: Dr. Hunt, in my own experience I have found that organic mulch applied to sod land during the hot months of August and September produced very beneficial results. Have you any information or suggestion as to the beneficial effects of organic mulch on the soil? Now, I have asked chemists this, and they cannot answer. Is there a better condition of nitrogen to the soil from the bacteria?

DR. HUNT: There is not any kind of doubt about that, Mr. Kester. Any condition where you have moisture and proper heat and shade, will be the condition in which nitric acid is formed. The explanation of it and the classification of it have never been experimentally demonstrated. You may say qualitively that it is so, but you cannot say quantitively that it is so. Personally, I think it is very important.

MR. DAVIES: Do you get as good results from the lime you burn?

DR. HUNT: Yes, provided you use twice as much. As a matter of fact, in our experiments we get as good results—better results—from two pounds of raw ground limestone than from one pound of burned lime. It don't make very much difference when you put it on, or how you put it on, just so you put it on.

MR. STOUT: Just so you get it on in the proper proportion.

DR. HUNT: You will have to buy your limestone at one half the price of the burned lime, in order to equalize it.

MR. GOODERHAM: How about the freight?

MR. SCHULTZ: Which is the most lasting quality?

DR. HUNT: It does not make any difference.

A Member: Is the one available as soon as the other?

DR. HUNT: It does not make any difference. As a matter of fact you get just a little better results with the ground limestone, provided it is finely enough ground to pass through a 60″ mesh.

The SECRETARY: Does it make any difference in price?

DR. HUNT: Sometimes; you must use twice as much. That is largely up to the railroads. Mr. Stevens says they are willing to make the farmer a rate provided they can be guaranteed that it is pure ground limestone.

Mr. SCHULTZ: How should it be applied—on what ground?

DR. HUNT: The lime? We prefer to apply it to plowed land, although, as I said before, it is important only to apply it. It has been our custom to ply it when we plow for corn, but I don't think it matters. You want to get it on your land once in a rotation, or once in two rotations. With lime cheap and labor dear, so when we put it on, we put on enough so that we will not have to do it again in ten years.

A Member: How many bushels to the acre?

DR. HUNT: Fifty bushels per acre; that is about a ton and a half. That is three tons of raw limestone and a ton and a half of burned lime. That is just about twice as much as is necessary to make our land grow clover. But it pays. Our experiments show that that land will continue to grow clover until it needs fifteen hundred pounds of burned lime to the acre. When land has got so it won't grow clover, it should be limed, and our experiments show that it will then require at least fifteen hundred pounds to get it to produce clover again.

The SECRETARY: One of the facts that we are to deduce from this discussion is, that if the railroad has a guarantee that it has pure lime the farmer will also get it?

DR. HUNT: Yes, sir.

MR. HOLMAN: What is the cost of grinding it fine enough to go through a 60″ mesh?

DR. HUNT: I don't know.

MR. GOODERHAM: Dr. Hunt, if the railroads asked for a guarantee from the lime men would it have any effect on the farmer?

DR. HUNT: I don't know, but I think it would.

MR. PIOLLET: Dr. Hunt, can you raise clover with lime without any manure?.

DR. HUNT: Suppose you have a piece of land on which you wish to raise clover and it does not raise clover, you can plow it up and lime it, or you can put it in corn and apply manure, and then put on 10 lbs. of nitrogen and 50 lbs. of phosphoric acid and potash. Take up your corn, put in wheat and apply 50 lbs. of phosphoric acid and potash. If your land ever grew clover, it will grow it again.

MR. HOLMAN: Does it matter from what source phosphoric acid is derived?

DR. HUNT: I suppose most of it comes from bone, rock &c. I don't think it matters much so long as it has been treated to make it soluble.

The CHAIRMAN: Doctor Hunt has given us a very good talk, and been very busy. I wish to say to him that up in Tioga county we have been very much interested in this subject. There are hundreds of acres up in our county today with which something must be done before we can get a crop. Some eight years ago we built the first road from Mansfield to Bloomsburg. From down the road some where they shipped a lot of limestone to put on that road, broken up from the size of an egg to the size of a pebble. What I want to get at is this: The road is practically worn out, but the dust from this limestone blew over the fields down along the river bed—sandy land, mostly— and where the limestone got to, the clover is growing when it won't grow anywhere else. We live in a neck of the woods where the freight rates make it impossible to get lime. I have been very much interested in the discussion.

I have here a note signed by John A. Biles, President of the Bradford County Historical Society, stating that their museum will be open every afternoon this week from four to six, and extending a cordial invitation to the members to visit it.

We will now take up the next subject, which will be "The Farmer and the Chestnut Blight," by Prof. Samuel Detwiler, Executive officer of the Chestnut Blight Commission, Philadelphia.

Prof. Detwiler spoke as follows:

THE FARMER AND THE CHESTNUT BLIGHT

By PROF. SAMUEL B. DETWILER, Philadelphia.

It is interesting to note the position of chestnut in the lumber world and as a factor of importance in Pennsylvania's lumber industry. The economical advantage of accurate utilization data to buyer and seller has been proved by the United States Forest Service, through its wood utilization Bureau. Many of the Eastern states also have a bureau similar to that of the National Forest Service. According to the government report on wood products in 1909, approximately 1944 mills were sawing lumber in 1909, approximately 1944 mills were sawing lumber in Pennsylvania with about five or six hundred planing mills, not including many other wood-working industries. The total cut in the United States for the same year was about 44,510 million board feet, valued at 686 million dollars. Chestnut lumber constituted 14.8%, valued at $10,-701,922. The total quantity cut in Pennsylvania was 1,463 million feet, board measure, valued at 23 million dollars. Of this amount 107 million feet was chestnut. This does not include the ties, poles, staves, mine props and cordwood. It is a well known fact that a large percentage of the cross ties, telephone and telegraph poles are of chestnut. In Pennsylvania there are 7,871,698 acres of timber land over one-fifth of which is chestnut. Knowing these facts, the importance of Pennsylvana's effort to save her chestnut from extinction will be more fully realized. Chestnut wood is used in some thirty different industries. It is one of the few trees that can be completely utilized, since the refuse can be ground up and used for making tannic acid extract.

A large number of people know of the inroads which chestnut blight has made on our forests, but few are acquainted with the exact nature of this new pest. Many cases of "Blight" on chestnut trees, when investigated, proved to be dead or unhealthy trees due to insect attacking, lightning or other common injuries. The real chestnut blight, more properly know as the chestnut bark disease, or the chestnut canker disease, is caused by a fungus (*Diaporthe parasitica),* and is not the work of an insect as some erroneously believe, although insects are no doubt very important in causing the wide distribution of the fungus. It affects all kinds of chestnut in varying degrees, but pure strains of Japanese chestnut have the power of resisting the disease, and suffer little injury from it. Living oaks and other trees are not attacked, so far as is now known, although the fungus has been found on dead oaks and on sumac.

The blight was first called to public attention in 1904, when chestnut trees in the Zoological Park, of New York City, were found to be dying from this disease. However, two reliable observers have reported that they found the diseased chestnut trees on other portions of Long Island as early as 1893, which had every appearance of suffering from the blight. The present extent of the blight is from Massachusetts to Western Pennsylvania, and south to Virginia. In the vicinity of New York, the chestnut trees are practically all killed, except Japanese chestnuts. There are accounts of general dying out of chestnut trees in portions of the South as early as 1824, and again in 1860, 1862 and 1878. It is not known whether this trouble was due to a fungus, or to the attacks of some of the well-known insect enemies of the chestnut.

Few people recognize the blight in time to save the affected trees, as the trees show little outward sign of their true condition until irreparably injured. Chestnut blight infection usually is first called to the ordinary observers attention through the death of one or two branches in the crown of the tree. If this branch is girdled by the fungus in early spring; the leaves turn yellow soon after they come out and the leaves wither much as in the fire blight of pear. When girdling takes place later in the season, the leaves assume their fall color and then turn brown and cling throughout the fall and winter. When a trunk or a large branch is girdled, numerous suckers or water sprouts are sent out from the base of the girdled portion. On smooth-barked trees, a canker usually develops where the fungus is growing. These cankers are areas of dead, discolored sunken bark usually more or less broken by cracks or checks into the inner bark. Old thick bark does not change in outward appearance until a year or more after it is diseased, when it begins to disintegrate and peel from the tree in shreds. After the thick bark is killed, it gives forth a peculiar hollow sound when struck a sharp blow, due to a space between the wood and the bark caused by the destruction of the inner bark.

The body of the fungus growing inside the bark of the tree shows as small, irregular, fan-shaped areas of a bluff-color. However the most reliable characteristic of the disease is the wart-like eruption of pustules which appear on the surface of the cankers. These pustules are about the size of a pinhead and are of a saffron or orange-yellow color, becoming dark brown with age. During damp weather the pustules produce twisted threads of spores, one-sixteenth to one-half inch in length and of a bright yellow clor. On old, furrowed bark, the pustules appear in the crevices of the bark. There are so many things which may be confused with chestnut blight that until a person is familiar with the disease it is best to have the opinion of an expert, before pronouncing the trouble chestnut blight. When in doubt, specimens of the dead bark bearing the pustules should be sent to the Chestnut Tree Blight Commission, 1112 Morris Building, Philadelphia, for determination. Owners of chestnut timber land who desire to have their holdings examined for the blight or to receive instructions as to the proper method of destroying it, should communicate with the Commission so that a field agent may be sent to give the desired assistance. If chestnut timber owners will watch closely for the blight during the coming summer and report the blight to the Commission as it is found particularly west of the Susquehanna River, it will be of material assistance to the Commission in their work of eradicating the disease.

The only sure means of combating the disease so far as is known, is to cut down the diseased trees and burn the bark of the diseased portion. Since the spores and most of the fungal threads are in the bark, if the diseased trees are cut down, and all of the diseased bark carefully burned, and a strict watch kept for new cases of infection as they occur, the disease may very likely be wiped out. Not only should great care be taken to burn all of the diseased bark from the infected trees, but all of the limbs and branches which are not peeled should be piled and burned over the stump, in order to destroy any infection which may be present there. The chestnut blight fungus often starts to grow on dead limbs. Stumps which have not been burned, should be completely peeled of their bark, and this should be burned on nearby brush heaps. The trees should be barked immediately after they are felled and the bark and brush burned, without being moved further from the stump of the felled tree than is absolutely necessary, since this moving always causes the scattering of spores, thus spreading the disease more widely. It is recommended that the brush and debris on the ground be cut and piled, prior to felling the diseased tree in order to facilitate the complete cleaning up of the diseased bark and branches after felling. That work may be successful, however, it is necessary that *every* owner of chestnut timber follow this plan of cutting the infected trees and burning the bark immediately. A single infected wood lot will re-infect surrounding wood lots, no matter how carefully they may be treated.

The Commission is attempting to establish a quarantine line and prevent the further westward spread of the disease. Spot infections are found some miles in advance of the main line of infection. In prompt removal of these spot infections as they appear lies the hope of protecting the timber in these regions and to the west. It is quite important that the people of this locality and to the west learn to know the characteristics of the disease, so that new infections can be discovered before the disease has spread greatly.

The blight problem in the southeastern part of the State, or where the per cent. of infection is very large, is largely one of utilization of the diseased trees. The advice given to owners is essentially this: Learn to recognize the blight, and keep thoroughly posted on the subject. Look over your land well, at least once each month during June, July, August and September. If you have timber that is infected arrange to market it at once, because a tree infected with the blight will die and the lumber rapidly deteriorates after the tree is killed. Cut all the trees that are at all affected. It would be wise to burn the bark that is infected with the disease and also the bark from the stump, to prevent its spread to your own and your neighbors healthy timber. Be very careful to watch and extinguish your fires. Try to get your woods in a better condition, so that only trees of value will be produced. Try if possible, to get some other species growing in place of the chestnut. By all means favor other species in cutting. Try at least to keep your own timber free from this disease.

The sale or local usage of chestnut timber cut on account of chestnut blight is of the utmost importance to the timber land owner. In many of the completely infected regions in the eastern part of Pennsylvania, cutting the chestnut clear is the only sensible plan, since where the disease is very abundant there appears to be no hope of checking its progress and the only practical plan is to cut and utilize all of the chestnut timber before it deteriorates further. As an illustration, a telephone pole buyer who has been operating on Long Island recently stated that for the last two years he had not found a single chestnut tree which was not diseased, and very few were alive, and that the chestnut timber there was now in such poor condition that it was no longer profitable to utilize the trees. The last tract he cut over contained over 600 trees fit for poles according to his estimate, but when the trees were felled he found that only 250 of them were sufficiently sound for use as poles. He stated that as a rule he had found after the trees were diseased for two seasons, the woods was no longer sound, but was brittle and doty.

Chestnut owners are naturally making inquiry as to the market for the various chestnut products. The Chestnut Tree Blight Commission is endeavoring to be useful to timber owners in eastern Pennsylvania by making its office a clearing house to bring buyer and seller of chestnut products together. A mass of information relating to prices and markets is being collected, and a list of persons desiring to purchase various kinds of grades of chestnut in each locality is kept together with a list of what the chestnut timber owner desires to dispose of. At the present time it is the Commission's policy to force the cutting of diseased trees west of the Susquehanna River only since the real fight must be made in the western part of the State where the disease is just appearing. Logs from infected trees may be converted into lumber, ties, cordwood, etc., after they have been carefully peeled. Telephone poles, posts, etc., are not likely to be a source of danger in spreading the disease, provided the bark has been removed and burned in the woods.

Cordwood may be marketed, but diseased sticks should be burned in the woods, since it would not pay to peel the bark from them. There are several firms in Pennsylvania that purchase considerable chestnut cordwood for tannic acid extract purposes, and some owners of timber land have for years been disposing of considerable quantities of wood in this way.

Several large chestnut orchards are being started in the State this year. In view of the prevalence of the blight and the fact that no means known to be absolutely effective in combating it are at hand, it seems unwise to spend money on planting any variety of native or European chestnut. The rigid inspection of chestnut nursery stock enforced by the Commission, is not absolutely certain to prevent disease, since in some cases trees may be infected and show no outward signs of it. Furthermore, the blight may appear in the vicinity of a thrifty chestnut orchard and wipe out the investment. It is true that we hope to check the westward spread of blight by cutting out the diseased trees as they appear in the western part of the State, but it is not certain that even this will succeed. In the eastern part of the State we have little hope of doing more than teaching owners of chestnut timber to recognize the blight, and to cut their diseased trees before they lose their commercial value. So far as the treatment of individual trees is concerned, we have so far found no remedy in which can be relied upon, although successful in some cases. By gouging out the cankerous parts with chisels and treating the wood and bark with an antiseptic coating of mixed tar and creosote, and by cutting off diseased branches we may delay the progress of the disease, and in some cases prevent the death of the tree. In most cases, however, all measures for the treatment of individual trees, including spraying, have proved of no avail in the long run.

Persons who are starting chestnut orchards, or contemplating doing so, should know of the danger presented by the blight. If they choose to take the chances after the facts are known, they cannot blame anyone but themselves if their money is wasted. It is quite possible that the blight may be kept out of orchards where a close watch is kept for the first appearance of the blight, and where surrounding woods within a radius of a mile or more, are kept clear of diseased trees. Spraying and fertilizing will probably assist in keeping the disease from gaining a foothold. It is also possible that before the blight seriously attacks young orchards, a cheap and efficient means will be found by which trees may be made immune from attack. In that case, those who invest their money in orchards at the present time will be well paid, since the value of the chestnut crop seems destined to become greater each year.

The Japanese chestnut appears to be the only variety which has any power at all to resist the blight, and even this species is not entirely immune. Where the Japanese chestnut is crossed with other varieties as is the case with trees produced from seed grown in this country or Europe, the resultant strains appear just as liable to be attacked as the native variety. Furthermore, the fruit of the Japanese chestnut is not nearly so desirable as that of the Paragon and other varieties as the flesh is tasteless, coarse and covered with a thick leathery skin. If it is desired to plant nut trees, attention should be given to the Black and English walnut. In the southern parts of the state the pecan may be worthy of experimental planting. For fence row trees, cherry, apple, mulberry, or other fruit trees, will not only produce revenue from the fruit, but also may be utilized for live fence posts and for shade. For forestry purposes, red oak and white pine can be highly recommended.

It is believed by many that unusual weather conditions have favored the growth of the fungus, and that it will decline again naturally. It is quite probable also that some medicinal remedy will be found to save valuable individual trees. At the present time however, the only hope of saving the chestnut appears to be sanitation through removal of diseased trees.

The co-operation of all owners is the end to be desired. If each owner took care of his own trees the fight would be already won. Do your own part and explain the disease and its consequence to your neighbors and friends. The Pennsylvania Chestnut Tree Blight Commission stands ready to give you all help that it can.

MR. DAVIES: Would it be advisable to let the centre grow where you cut down a tree that has been blighted?

PROF. DETWILER: From the most recent information we have, it is our idea that where the trunk has been pealed, the tree can be saved. In Philadephia we have stumps from trees that have been cut for over a year, and they are still alive, but in New York they have not been able to do this. However, these trees were not cut as quickly as we cut them in Pennsylvania. If you will write us, or better still, send us sample, we can tell you positively.

DIRECTOR MARTIN: Will you please tell us again how we can detect the disease?

PROF. DETWILER: Yes, sir: We found our first case in Bradford county within the last day or two. First, you will see the dead branches with leaves still clinging to them. Then at this time of the year, they are girdled with a fungus growth; the leaves are pale, and they do not come to the full size. They turn a pale, sickly, yellow-green, just as though they had been killed by fire. The most rapid growth is in June and July. The appearance changes during this month, soon taking on a fall appearance, and then the leaves and branches soon die. In the city you will see trees standing with one half of the branches dead, but with trunk still alive. You will generally find a dead spot where the fungus starts, and from there it girdles around the live bark of the tree instead of going up and down the branches. If the diseased bark is raised, on the dead tree will be found a yellowish matter composed of minute spores. In addition you will also find a great mass of suckers or water sprouts so that where you see a tree half dead with a great mass of suckers make investigation for the pustules. If you are not absolutely sure, even then, take off one, or two, or three square inches of the bark, and mail them to the Commission and we will determine.

MR. RODGERS: How is this fungus carried?

PROF. DETWILER: That is something we would like to know. These spores are very minute, and if they touch a drop of water, will dissolve at once, but in dry weather they remain intact. It is our idea that they are carried from tree to tree on the feet of birds, and my own idea that they are also carried from tree to tree by ants and other insects. Very few are carried by the winds. It may be that the spores are washed down on the ground by the rain, and when it becomes dry, the wind carries the dust to other trees. We do not know that ants eat the spores, but the trees are full of ants.

MR. HOLMAN: Is it a fact that it cannot affect a healthy tree?

PROF. DETWILER: The infection takes place through a wound in the bark. Every insect has to make a wound in the bark, and the trees are full of insects at this time. When the spores wash down, they get into these wounds, and the whole tree becomes infected. Again, we find marks on them resembling the claws of birds. However, I believe the insects carry the disease. I want to protect the birds. They are only doing what Nature intended them to do— going after the insects.

MR. DAVIES: This blight generally commences at the top of the tree, does it not?

PROF. DETWILER: We first notice it at the top of the tree. On the trunk it does not grow so rapidly on the thick bark and it takes longer to girdle the tree, but in 95% of the trees we have examined, it started on the trunk of the tree at about the same time it did on the top. Mr. Williams, the Deputy State Forester examined 50,000 trees, and finds practically this same condition.

MR. FENSTERMAKER: The question has been raised as to whether it is advisable to burn the stump of the tree; for two reasons: One is, that the tree does not easily start from the burned stump, and the other is, the danger of starting forest fires. If you bark the tree, it will start from the old stump very vigorously, but if you burn it, it will not.

PROF. DETWILER: I have not been in this work or perhaps any other, long enough to be able to speak with much authority on this subject, but I have been in charge of lumbering operations where we burned the stump and got excellent results from the burned stumps. Chestnut, perhaps, is not so quickly to sprout as some others. The trees I was working on were soft maple and birch. Now, we will know more about these things at the end of the season then we do now. We are going at the work here. For instance, we are trying an automatic air sprayer, using crude oil, which will not be so hot that the leaves will be injured. My opinion is that unless the fire is exceedingly hot, it will not effect the tree, because, you know, a chestnut tree sprouts from the roots.

MR. RODGERS: Has there any affected trees been found in the central part of the State—for instance, in Mifflin, Juniata or Huntingdon counties?

PROF. DETWILER: We find a great deal of it in Huntingdon county, on stumps that were cut three or four years ago, where the disease got into the stump two years ago, after the sprouts started. We have found the blight in every county in the southern tier from Washington county all the way east; in the western part of the State we have not found much blight except a few trees in Beaver, and a few in Westmoreland; in the north, we have not found it except in Clinton, Susquehanna and Wyoming.

MR. RODGERS: Do you find any in Dauphin?

PROF. DETWILER: Yes, sir; at Hummelstown we have from 10% to 15% of blight.

MR. RODGERS: Is there any in Juniata?

PROF. DETWILER: Yes, sir; scatter throughout the country in small groups of trees, but not yet thoroughly infected.

MR. GOODERHAM; If you find a tree not very badly affected and you remove the tree, will that do the work?

PROF. DETWILER: We cannot say. We have been at the work only eight or nine months. The work done in Philadelphia has been done systematically, and we have had no return of the blight. But the work Dr. Metcalf did at Washington was not done systematically, and after a year or so, it was found that the disease had been communicated to the other trees.

MR. DEWITT: The State owns a great deal of timber land; who is going to look after that?

PROF. DETWILER: At the last meeting of the Commission, preparations were made for that.

MR. DEWITT: I know about a hundred acres of woodland and they tell me there is a great deal of young chestnut timber. I have not seen it for several years. I don't know whether there is any blight there or not.

PROF. DETWILER: There is very little blight there. We find diseased trees scattered here and there all over the eastern part of the county.

The CHAIRMAN: If there is nothing further, the meeting stands adjourned until 9.30 tomorrow morning.

Wednesday, May 22, 1912, 9.00 A. M.

ADJOURNED MEETING OF THE STATE BOARD OF AGRICULTURE

Mr. Seamans in the Chair.

The CHAIRMAN: The meeting will please come to order. This session of the Board is, as I understand it, a continuation of the session we had yesterday morning for the purpose of passing a Resolution.

The SECRETARY: The purpose of this meeting is to hear the report of the Committee appointed at the last annual meeting. I think Mr. J. Aldus Herr is the Chairman of that Committee.

MR. J. ALDUS HERR: Well Mr. Chairman, some of the members of that Committee are present; and as I understand it, when that meeting adjourned at Harrisburg, it was to meet again and look after special legislation. Since that time there has been nothing done and there has been nothing to do. But I understand there are some persons who have suggestions, which we shall be glad to consider any time. They wish to meet us, but as I understand it, there has been very little that could be done in the intervening time between that session and this.

The SECRETARY: Then I think the Committe had better report progress and be continued.

Mr. J. ALDUS HERR: It is a very difficult thing to do anything when there is nothing to be done.

The SECRETARY: But you are ready to go on with the work at any time?

MR. J. ALDUS HERR: Yes, sir.

The SECRETARY: Then you can report progress.

DIRECTOR MARTIN: This Committee was appointed simply to confer with other committees on the same subject, and cannot very well do anything until the other committees are ready to report.

The SECRETARY: This Committee having reported progress, I move you it be continued to report at the next meeting.

MR. BARNES: I second it.

This motion was duly carried in the regular way.

MR. J. ALDUS HERR: I would like to ask for a little information. When we meet in January, isn't that a little late to do anything on the subject?

The SECRETARY: You will probably have done all that there is to do, before that time, and you will simply report what has been done. The committees Mr. Martin speaks of will have been appointed and will have conferred with them before that time.

MR. J. ALDUS HERR: The Chairman will be ready to meet this Committee tomorrow morning at nine o'clock.

The SECRETARY: I therefore ask to amend my motion that this Committee be continued to report after meeting to-morrow morning. If there is no objection, this can pass without a vote.

DR. CONARD: I should like to offer a resolution, if I am in order. The resolution is as follows:

"Resolved: That a Committee of three be appointed, whose duty it shall be to arrange, if possible, for a meeting with a like committee to be appointed by the State Livestock Breeders' Association, the State Dairy Union, the State Horticultural Association, the State Bee-keepers' Association, the State Poultry Association, the State Grange, the Rural Progress Association, and representatives of the School of Agriculture and Experiment Station of the State College, for the purpose of federating these organizations and thereby securing their co-operation in all matters relating to the advancement of the interests of agriculture in this state."

I put this in the form of a motion.

MR. JOEL A. HERR: I second the motion.

This motion was duly carried in the regular way.

The CHAIRMAN. Is the Chair to appoint this Committee, or is it to be appointed by some one else?

The SECRETARY: I think so.

MR. JOEL A. HERR: I move that the Secretary of Agriculture appoint this Committee, and keep in touch with it.

This motion was properly seconded and duly carried in the regular way.

The SECRETARY: I appoint to act on this Committee: Dr. M. E. Conard, Mr. J. Aldus Herr and Mr. D. S. Taylor.

The CHAIRMAN: Any further business to come before the Board at this time?

MR. PATTON: Following the talk of Dr. Hunt on the guaranteeing of lime, can't you take some action on the subject, requiring a guarantee to lime, something like the fertilizer question? I move, therefore, that the Secretary and the Legislative Committee be instructed to do something to bring about legislation requiring the manufacturers and sellers of lime to guarantee the analysis of their shipments, whether in bulk or in car.

The SECRETARY: I think possibly the gentleman is laboring under a misapprehension. I don't know the voice, and this is a meeting of the State Board of Agriculture, and only members of the Board may make a motion.

MR. PATTON: I am a member of the Board.

The SECRETARY: Then, I beg your pardon.

MR. FENSTERMAKER: There might be no objection to having a motion of that kind, but I think it is a little ridiculous for the railroads to quibble about carrying lime without a certain percentage of calcium or silicon.

MR. YOUNG: It has to guarantee to the buyer that he is getting something worth the money.

MR. FENSTERMAKER: The risk does not rest with railroads.

MR. KILLAM: In order to get the motion properly before the house, I second it.

MR. SCHULTZ: I think it is an excellent motion; give the farmer all the protection he can get. He needs it.

MR. DEWITT: I live in a neck of the woods where we would like to see that motion prevail. We need lime badly in that country, and we cannot buy it with the freight rates prevailing as they are. As I remember it, the gentleman representing the railroads said we could get rates, if some sort of a guarantee prevailed.

The SECRETARY: If there is no objection, I would like to have this motion amended so as to specify the ground lime, and not the oxide or burned lime.

MR. PATTON: I meant to include all characters of lime.

The SECRETARY: Then that is understood to be the motion.

The question having been called for, a vote was taken, and the motion was found to have been duly carried in the regular way.

MR. KAHLER: If I am in order, I would like to move that we elect delegates to this Normal meeting. I would like to nominate Mr. Posten, a former member of the Institute force.

The SECRETARY: This part, Mr. Kahler, is a State Board meeting, but if you will make your motion to the effect that all persons interested in agriculture, who are in attendance at this meeting, shall be invited to seats in council with us and given the privileges of the floor, they to report their names to the stenographer, it will cover everything.

MR. COWAN: I second it.

The SECRETARY: Now, I would be very glad to have any persons here present their names, and they will appear in the report of the proceedings.

The following persons reported their attendance, in response to this invitation: Mr. E. Monroe Posten, Mr. Edward Piollet, Mr. F. R. Stevens, representing the Lehigh Valley Railroad and Mr. E. S. Fowler, representing the Universal Portland Cement Co.

MR. JOEL A. HERR: I move we adjourn.

This motion was properly seconded and duly carried in the regular way, whereupon the State Board of Agriculture adjourned.

PROCEEDINGS OF THE NORMAL INSTITUTE—Continued.

Wednesday, May 22, 1912, 9.30 A. M.

Mr. D. A. Knuppenburg, in the Chair.

The CHAIRMAN: It gives me pleasure to meet with the State Board in our home town of Towanda. I have been passing over the State a great deal the last few years, and I find we have one of the best counties in the State. It is a source of disappointment to our farmers, as well as to me, that so many of them are unable to be here and meet the Secretary and Dr. Hunt, and the men who go to make up this Board, but it is due to the conditions under which they have been laboring, and they as well as we, must make the best of it. There is no class of men who are received more attention from our State government than the farmer, and we all appreciate these opportunities. The State College is showing some wonderful results from the efforts of the men scattered over the State, and I have noticed this in different states. The people are beginning to realize that without agriculture they are unable to exist. That is, agriculture is the foundation upon which all other things rest.

Some time ago I was at a political meeting in Ohio, and there I heard a Senator speak to an audience of farmers. He said in part: "I have held the plow to turn the deep rich soil; I have followed the old spike-tooth harrow from the rising to the setting of the sun, and I have swung the old grain cradle until the sound of that old tin dinner-horn was the sweetest music that ever fell on my ear."

Some of our greatest men in all walks of life have been the product of the farm.

We have now before us the first subject of the morning, and it will be taken up by a man who has harvested the fruit and knows the tree. He does the work, and gets the money. I take pleasure in introducing our expert orchardist, Mr. F. H. Fassett, who will now talk to us on "Care and Management of the Orchard."

Mr. Fassett spoke as follows:

CARE AND MANAGEMENT OF THE ORCHARD

By F. H. FASSETT, Meshoppen, Pa.

Apple growing in Pennsylvania has become a very important industry. There are several reasons for this. We have more acres adapted for growing apples than any other state in the Union. We have the climatic conditions and the soil that will produce the apples of high quality, and we are at the very doors of the best markets in the world. With all these natural advantages, it would seem that our Creator intended Pennsylvania to be dotted over with apple trees.

Despite these advantages, it requires close attention to all the details in order to succeed. Success in apple growing depends largely upon "The man behind the gun." I believe there is developing a set of men, under the instruction of our Farmers' Institutes, State College and other agencies, who will be an honor to our State, and who will develop these natural resources, and the old Keystone State will take her place where she belongs—at the head of the apple-producing states of the Union.

Our markets are demanding apples of high quality. If you will study the markets for the last few years, you will find that the apples of high quality are gradually coming to the front and bringing top prices, while those of poor quality are bringing less money. It becomes more important that we shall plant only those of high quality. The same variety will not be adapted for all parts of the State, but we have those of high quality for each section. For practical purposes, we can divide the State into two sections—the northern and the elevated portions of the central. For this section we have the Spy, Baldwin, Rome Beauty, Grimes' Golden and Bellflower for the leaders, while for the southern, and lower lands of the central, we have Grimes' Golden, Stayman Winesap and Jonathan. These lists might be enlarged, but no one will make any mistake in setting these varieties. Many orchards will never prove as profitable as they should, on account of having selected varieties of poor quality.

As an illustration: A farmer in northeastern Pennsylvania purchased the following list of varieties: Fifty Delicious, fifty King David, fifty Ben Davis, fifty Black Twig. We would consider it a mistake to set any of the above varieties except in an experimental way. Thousands of trees are being planted each year that will never live to bear profitable crops.

Many plunge into the fruit business under wrong impressions thinking that the business is all income, and not much outgo, but when they once realize the work necessary to grow a tree, and the continued fight necessary to protect them from insects and fungus diseases, they grow discouraged and throw up the whole job.

There are farms in Pennsylvania with good orchards that are sadly neglected, and practically no returns are realized, that, with proper management, might be made to produce more clear profit than all the rest of the farm.

There are a number of different factors entering into successful orchard management; but to my mind the keynote is the full control of soil moisture. There are two distinct methods of orchard management; each has its advantages, but the central idea is the control of this important element. The question is, which one of these methods is best suited to our orchard, viz: sod mulch, or clean tillage and cover crop. Any system that will hold the moisture where the roots of our trees can get it when they need it to mature the crop, is a correct system. We can add plant food to any of them. My experience, and the experiments under the direction of Dr. J. P. Stewart of State College, demonstrate the fact that clean tillage and a legume cover crop is the most economical method for the control of this great factor. By plowing down each year the legume cover crop, we not only add plant food, but we are constantly adding vegetable matter thereby increasing the water-holding capacity.

The crop not only depends on the moisture, but some of the fungus diseases are caused by the lack of moisture. Prof. H. R. Fulton of State College, after a thorough investigation of the Fruit Spot, made this statement, as above. Moisture control cannot be emphasized too much. We must study our conditions carefully, and when clean tillage cannot be employed, we must resort to the mulch system.

Spraying is another factor entering into successful orchard management. Most of the spray calendars and bulletins are confusing to the uninitiated. They recommend so many different materials, and so many different applications. For practical purposes, we find that in most cases, three careful sprayings will protect our trees and fruit. Concentrated lime-sulphur solution has come to be recognized as the safest and best contact insecticide; it is also a fungicide, and can be used in all the sprayings. Arsenate of lead is considered the best form of arsenic for the chewing insects. We aim to bunch the different spraying: The first spraying for scale insects, and the larvæ of the bud moth, blister mites, aphids and smooth fungus. This spraying is most effective if left until the buds commence to burst open, and is safe until the blossom buds begin to show pink. The material for this spray is lime-sulphur at a density of 1.03. In getting the density of a solution, use the hydrometer. Test the density of the concentrate, and divide by the density of the spray solution. For example: If your concentrate test at 1.24, and you wish a spray solution of 1.03, divide the decimal of the concentrate by the decimal of the solution you may want. It will indicate the number of gallons of water to use with each gallon of the concentrate. In making your dilution in this way, you are always safe, as the density of the concentrates differs very much. The commercial lime-sulphur solution tests as high as 1.35, while the home-boiled hardly ever exceeds 1.28. The work must be very thorough; every twig and part must be coated with the spray. We should not try to use a pump that will not give us at lease 75 to 80 pounds pressure, and more is better. Use a nozzle making a fine mist.

The second spraying should be done when about 90% of the blossoms have fallen, and while the lobes of the little apples are open. They close up in about six to ten days after the blossoms fall. After they close, you cannot spray successfully. This is the most important spray for the fruit. At this spraying, we are spraying for the larvæ of the codling moth and all leaf-eating insects and fungus diseases, such as apple scab, smooty blotch frog-eye fungi, and the apple curculio. The spraying should be done largely from a tower or platform raising the operator seven or eight feet from the ground, using a ten foot extension rod, 54 degree elbow and two good nozzles on large trees, drive clear around, stopping at least four times. You can then force the spray right into the calyx cup and coat over all the foliage. The one motto is "thoroughness." The materials for this spraying are lime-sulphur solution at a density of 1.01, with two and a half pounds of arsenate of lead added to every fifty gallons of the solution. Do not put the arsenate of lead in the tank until you are ready to go to spraying.

The third spraying, in well-cared for orchards, where tillage is practical, might be dispensed with if the other sprayings have been well done. When used it should be applied when new leaves have formed and apples have grown, so that there are foliage and apples are not coated with spray materials. This period usually occurs thirty to thirty-five days after the second spraying has been done, using the same materials as in the second case.

With these three sprayings, we can control the enemies of the tree and fruit. The cost of the three sprayings differs according to the trees. A tree with a spread of thirty feet and fifteen years old, should not cost over forty cents per tree. With these sprayings well done, we can rest assured that we will have apples that will bring top prices, and if well packed, we need not be ashamed to put our name and address in each package.

The manner of handling fruit is of great importance. We should pick when fruit is matured, and handle them like eggs, using rigid pail or basket to pick in. An oak stave basket with swing handle is an ideal package to use. With some of the more tender varieties, the basket should be lined, and the pickers wear canvas gloves. Apples should never be piled on the ground. They will soon lose their keeping qualities. They should be taken directly to the packing house, or placed on a canvas-covered packing table and packed directly into barrels or boxes and place in cold storage as soon as possible.

Pennsylvania growers have fallen down in marketing their apples. First, we have not been packing them honestly. We face them up nicely, and then fill with apples that are inferior, and no wholesaler can be found that can stand behind the average barrel of Pennsylvania apples and guarantee them alike all the way through. We must get on to our barrels and boxes a stamp that means something, so that when our apples are offered for sale, the wholesaler will not have to open them to know what the package contains. We must learn to pack honestly, and then learn to stand behind our pack with a binding guarantee. We cannot expect to drive our Western competition until we establish some brand or label that means something so that the wholesaler can guarantee, without opening the package, the fruit to be alike all the way through the barrel or box, just as labeled. This may be accomplished by the Fruit Associations. At present an Association label is looked on with more favor by most dealers, because of the successful operation of such Association in the West. An individual grower may, by honest packing, establish a reputation for his fruit when he can ship by the carload.

I take a decidedly optimistic view of apple growing in Pennsylvania. We cannot expect to always get as good prices as has been prevailing for the last few years. Competition is becoming keener each year, and it is up to us who have all the natural advantages, to cheapen the cost of production and furnish to the consumer a high grade apple, put up honestly, at a moderate cost, and I believe we will do it in the near future. We ought to be enabled to furnish first-class apples at a good, living profit, at one dollar, net, per barrel.

The matter of over-production does not worry me in the least. We will never have too many first-class apples. I can see nothing but success for the careful grower. We have no time or place for the pessimist in the fruit business. You can't spell failure in the fruit business; you cannot point out to me one failure in the fruit business in Pennsylvania, when good methods and good business ability were employed. I believe there is a bright future for the man who plants apples of high quality and employes up-to-date methods. Apple growing in Pennsylvania is on a sound busness basis, and is bound to succeed.

A Member: How long after spraying with arsenate of lead will it be safe to pasture the orchard?

MR. FASSETT: Well, we never pasture our orchard; but I know some instances where hogs and calves have been in the orchard all through the spraying period, and no bad results have been found, because the solution is so light—two pounds to fifty gallons of water, not to speak of the small amount of the spray that reaches the ground.

A Member: Do you grow a summer and winter Bellflower?

MR. FASSETT: We grow the winter Bellflower.

A Member: The only reason I want to know is, with us the Bellflower ripens about October or November, and it is a very fine apple, but I understand that there are Bellflowers that are not ripe until January.

MR. FASSETT: It may be the same as our Baldwin; up here it ripens late in the Fall; in the southern part it ripens early.

MR. JOEL A. HERR: I would like to ask the gentleman a question: He said it did not hurt the hogs and calves to turn them into the sprayed orchard; is it not because he did not turn them in? I believe he said he did not pasture his orchard.

MR. FASSETT: I didn't turn them in. It was not in my own orchard.

MR. J. ALDUS HERR: There was a gentleman in our neighborhood who sprayed his orchard a year ago for codling moth. I can't tell you now what he used, but within two days after he sprayed, he had lost seven head of cattle. He got the veterinary to hold a postmortem, and it was found that they died from the effect of poison.

MR. FASSETT: They must have gotten into the arsenate of lead barrel and drank it.

A Member: Isn't it about time for the second spraying?

MR. FASSETT: Yes; in our section. Some varieties of the Baldwin and Bellflower are ready to spray now; the Spy is not quite ready now yet.

MR. KESTER: I read the other day of some experiments made by adding two cakes of laundry soap to a barrel of water, in order that the arsenate of lead might stay better in the emulsion. It is claimed that only 25 per cent. of the arsenate of lead will settle in a given time by the use of the soap. Have you ever tried it?

MR. FASSETT: I never have. We always use a pump with a good agitator, which I think is all that is necessary; our solution is practically the same at the bottom as it is when we commence.

A Member: I read sometime ago that we should never start a new orchard on soil that had never been cultivated. I should like your opinion on that.

MR. FASSETT: I would not want to agree with that. I think the new soil is good for apple trees where an orchard was started without logging; he just dug the holes and put in the trees, and has not a very successful orchard there, about twelve years ago.

A Member: Would it not be running a little risk from root rot under certain conditions? I know of one case here in Pennsylvania where considerable trees were lost from this condition.

MR. FASSETT: Root rot is something that our scientists have been unable to tell us much about, or how to prevent it. There might be in new ground some relative danger of root rot, but yet, to my mind, it would be very slight.

A Member: It is claimed that it is very often found in regions where the poke has been growing.

MR. FASSETT: The condition that causes it has never been fully discovered.

DR. HUNT: I would like to ask a question that is rather difficult to answer, and I don't expect to have it answered definitely, but I would like your opinion as to what is a practical size for an apple orchard. That is, we know that the farmer has to have a certain unit within certain limits. Now, what do you consider about a unit for an apple orchard—ten, twenty, or thirty acres, and what number of apples trees would be a good unit?

MR. FASSETT: My thought along that line has been that about twenty-five to thirty acres is about what we might call a good unit. With more than that, the profits per acre are cut down, and that I believe is the point; therefore I would consider twenty-five to thirty acres a unit.

MR. FENSTERMAKER: I would like to ask the gentleman whether he believes that the indiscriminate planting of apples going on in the Eastern United States at present is going to be profitable?

MR. FASSETT: Well, I believe things are going to sift down. I believe it is going to be done on a more sound business basis than ever before, and I believe that the apples planted under these conditions will prove profitable.

A Member: That will increase the production, will it not?

MR. FASSETT: Yes, sir; my opinion is that we should be able to produce apples at a net profit of a dollar a barrel. That will bring good apples within reach of people who cannot now afford to get them, and still give the producer a good living profit.

A Member: It is coming to that basis.

MR. FASSETT: We have fewer trees in Pennsylvania today than we had ten years ago.

A Member: Bearing trees?

MR. FASSETT: Apple trees. I think the statistics show about 60% less than in 1910.

DR. CONARD: About twenty-five or thirty acres of orchard on a hundred acre farm, about how much help would you have to employ for that?

MR. FASSETT: Well, I have thirty acres, and we employ two men regularly, and, of course, myself thrown in. When it comes to picking time, and gathering the fruit, we employ eight or ten pickers, but the two regular men and myself do all the regular work besides the picking.

DR. CONARD: Do you carry on other farming besides orcharding?

MR. FASSETT: Some.

MR. J. ALDUS HERR: Relative to the production of apples from the amount of apple trees planted, I believe the result will be the same as in other things—dairying, for instance; a large percentage of them will drop out. How many poultrymen are in the business five years afterwards? How many of these orchards will be in existence at the end of twenty-five years? It always works down to the practical man; the others drop out.

MR. FASSETT: That is true, and yet we are practically at the doors of the best markets in the world here, and the West is supplying that market, taking away from us the very cream of that market and that in spite of the fact that we can produce a better apple. When we get down to the point of putting out apples on the market right, and capturing that market for ourselves, I see great opportunities for apple growing right here in Pennsylvania. I believe it is possible for us to grow a good apple and produce it cheap enough to keep the Western man out. I believe that we can do this at a net profit of a dollar a barrel, and grow a good apple and get it to market right, and still have a good living profit at that figure.

MR. KESTER: In answer to Dr. Hunt's question, you do not mean to say that the general farmer with a hundred and twenty-five to a hundred and fifty acres could take more than twenty-five or thirty acres orcharding? You mean a specialist, do you not?

MR. FASSETT: I don't think the average general farmer has any business to put out twenty-five or thirty acres. We need specialists. The man who goes into the fruit business in Pennsylvania today will have to be in love with his business and then he will succeed.

MR. KESTER: What should be the size of the general farm orchard?

MR. FASSETT: Judging from what I see over Pennsylvania, it is pretty small, as a rule.

MR. NORTHUP: Would you recommend putting the winter apple into cold storage?

MR. FASSETT: That has been my practice.

MR. NORTHUP: Sometimes it succeeds, and sometimes it don't.

MR. FASSETT: I have found it very successful.

MR. FENSTERMAKER: I referred to the Bulletin from the Virginia Experiment Station, in which it is said that they are planting orchards in soil like that in the Lebanon Valley and without taking the character of the soil into consideration, and the result will be failure. Now, I think it would be well to caution the people in regard to this indiscriminate planting in any kind of soil, and anywhere. That is the danger.

There are certain kinds of soil, and certain places where the apple will succeed better than anything else, but it is wise to be cautious about this indiscriminate planting.

MR. FASSETT: There has been some complaint along that line in the West for a number of years. I have seen this caution that you speak of, and I do not recommend this indiscriminate planting on all kinds of soil, and by all kinds of people, but I do believe that the apple farm in Pennsylvania is coming because a lot of people are beginning to understand their business better than they did, and I don't believe that this form of speculation is entering into the business in Pennsylvania so largely as it has done in Virginia and in the West.

The CHAIRMAN:Certainly Brother Fassett has given us a very interesting and profitable address on this subject. The next number on the program is an address on "Feeding and Management of Dairy Cows." This is a great dairy country, and we have with us one of the great dairy experts of the State, Prof. Van Norman of State College, who is too well known to us to require any introduction, and who will now address us.

Prof. Van Norman spoke as follows:

FEEDING AND MANAGEMENT OF DAIRY COWS

By PROF. H. E. VAN NORMAN, State College, Pa.

Mr. Chairman, Ladies and Gentlemen: There has recently come into use a new phrase, and the thought and the wish has come into my mind, that this phrase might be applied in a different way. The phrase is, "Farming with dynamite." I consider it one of the most sensible things that can be applied to the farm today, and I wish the firm that has dynamite to sell would find some way to apply it to the farmer, as well. I believe the best thing that could be done would be to give our farmers a charge of dynamite strong enough to lift them out of the rut in which they are.

This session is composed of representative Institute Lecturers of Pennsylvania, and Chairmen of the County Institutes. This is not supposed to be an average audience, and I fear that sometimes we forget that fact. We are the exception, or else we have no business being here. You are the men who are the leaders in your counties, and you are the men who are going out to help the leaders in your respective counties raise the average man there up a little bit. Now, the last speaker is not an average apple grower on an average farm. He is the exceptional farmer and the exceptional apple grower, and I wish that somehow we could plant in the minds of our speakers the necessity to emphasize the thought that in order to get out of his rut, a man must do somthing more than the average man. Why is it that the last speaker could go out and compete with the Western apple grower? Because he did not sit down in a rut. The Western men got out of the rut, and they can send their apples right in here, where we can produce them cheaper than they can, and we have to compete with them, and can't do it with the average man.

Now, to get down to my subject. I have no patience with the man who tries to run a successful dairy with the average cow. To be successful, he must get rid of that average cow, and get out of his rut. We got some figures from the patrons of our creamery at State College, of which there are one hundred and eighty at the present time, and we found these conditions, viz: That on one farm there were fifteen cows kept; four of them did not pay for themselves, and the other eleven made a margin of two hundred dollars. Now, then, these four cows brought down the average. If they could be disposed of, the other eleven would show a larger profit.

There is one thought that I want to impress very strongly, if I can, in regard to the management of a dairy farm, and that is, that in order to increase our profits, we need not look to our sale price, but we can do it ourselves on the farm. Now, the man who is keeping eleven to fifteen cows and shipping his milk into New York might just as well look into this, because he can not change his price. That price is regulated by the great law of supply and demand, and I don't believe the price is going to change very quickly; whether it is in the next sixty days, or within the next two years, the man who produces milk will have to take the price that is fixed by the great law of supply and demand. So we will eliminate that and take up the next proposition.

The first thing we must do is to eliminate that unprofitable cow and get rid of her very quickly. Why is it that every farm in this county is feeding two or three cows, not one of which pays for her keep? Simply because they are in a rut, and all the College can do, and the Farmers' Institute can do, and all the State Board can do, and all the Railroad can do, all the other agencies can do, is to apply a little bit of dynamite and jolt them out of their rut. Not even the

Legislature can legislate profits into the pockets of the average man. All we can do is to show him how to get it.

Now, after we have eliminated the cow that is unprofitable, what shall we do with the others? I will confine myself to the feeding problem. I will also eliminate the fact of the high price of feed; that is something we cannot control. What can we do? The first thing we can do is to quit feeding that high-priced stuff to the cow that does not pay for it. The next is, that the cow must eat three hundred and sixty-five days in the year and we must feed her something that is worth money. If the feed does not do it, we should add the profit in some other way. We sometimes forget the value of our pasture. We have it, and it must be made to produce some profit. Your cow should be made to produce a profit for every acre that she eats what grows on it.

The next thing is that she must not only be made to pay for her maintenance and her management, but she must pay for what it costs to produce her milk. Therefore the amount of milk produced in one year is a very important feature in the feed of that cow. I am not a very good chalk artist, but I believe some things sink in better through the eye, than through the ears. We have a dollar's worth of milk, and feed her ninety-nine cents worth of feed; where is the profit? If we were to feed that cow a dollar's worth of feed, and get two dollars' worth of milk, there is some hope of there being a little real profit in it. The first thing to do is to know what we are doing. When we come to the feeding point, there are two things that enter in: the first is the ability of the cow to consume feed, and then to supply her with what she needs, not only in quantity, but in kind. Our Experiment Stations have been telling us for the last thirty years about "balanced rations," but it is only for the last five years that it seems to have come down to a practical working basis, and out of it has come the proportions I am giving you this morning. The man who keeps cows may fail to balance his rations, and still show a profit, but it is possible to make a mixture of feeds and feed it to the cow in proportion to her grain feed so as to give her the variety she wants, and be reasonably sure she has enought to give her ability to make milk and take care of herself. The first thing we want to remember is that she must have enough milk; the next thing is that in making up her mixture, we do not simply make a grain mixture.

Now we want to reduce it to figures, and we can do this according to the law of digestible nutrition, and it can be done according to our new standard. The cow must get enough protein, and, second, she must get enough energy to meet her requirements for maintenance and milk production. To many of you the term "energy," I think is new. The best definition of energy is a very short one: "Energy is power to do work." You can measure oats in a quart measure; you can measure oats on the scales; you can measure oats in terms of digestible nutrition. You can also measure these oats in terms of energy—the work they will do. You can put these oats into the furnace and burn them, and they will turn that energy into heat; we can put them into the engine, and they will produce steam; you can put them into the silo, and turn their energy into power, but power comes from the oats. Every feed we have can be measured thus, in the terms of its power to do work. Now you have the explanation. Lay it aside for a moment, and remember that there are only two things we are going to do—try to furnish that cow enough power to take care of herself and to make her milk, and be sure that we remember that the energy comes from protein. You can get energy from sawdust, but you cannot get the cow to use it. She must have protein.

A thousand-pound cow requires five-tenths of a pound of protein and six therms of net energy every day, three hundred and sixtyfive days in the year. The therm is the unit of measurement, just like a quart of oats, or a gallon of milk. If you want to know more about it, write for the Bulletin on "Computing Dairy Rations." If this cow is going to make twenty pounds of milk that will test 4% fat, it will require one more pound of protein and six therms of energy more, or she will require a total of one and a half pounds of protein and twelve therms of energy per day. Now, if that cow has the ability to make twenty pounds of milk, and you only give her a pound of protein and eight therms of energy, there are just two things that can happen: If she is fat, she will rob her body and put it into the pail; if she is a dairy cow, or if she is not fat, she will not put it in the pail. And wherever you find the cows are not putting it in the pail, if they are dairy cows, they are not given enough to do it with, because Nature has so fixed them that they will take care of themselves first.

Now, if she is to make forty pounds of milk, she will require another six therms, and another pound of protein. In other words, the more milk the cow makes, the cheaper she makes it, because she only has to take care of herself once. Some of our farmers do not think of that. They only think of the amount of food they use, and of the profit. We should think of the returns we are getting.

I wonder whether I have made this plain—that every cow should be fed to the limit of her ability to use it above maintenance. It does not cost more to maintain a twenty-thousand pound cow than any other because the cost of maintenance is practically the same.

How shall we feed our cow, so as to be sure to give her what she needs? Let us use a few figures: A 1000 lb. cow requires 5 lbs. protein and 6 therms for maintenance; if she is to produce 20 lbs. of milk, we must add one lb. of protein and six more therms of energy, making a total of 1.5 lbs. protein and 12 therms of energy for the production of twenty pounds of milk, and for maintenance. I would suggest this rule: feed one pound of grain to every three pounds of milk. Now, that is not the only rule, but it is a safe rule. You can give it to your ignorant farm hand, and if he follows it, you may be sure that there is no danger to your herd; or you can give it to your brilliant son, or to the college man, and your cows will be safe. According to that rule, the cow that produces twenty pounds of milk a day will require about seven pounds of grain, because three into twenty is near enough seven to be called seven. Seven pounds of grain furnish about four therms of energy. Having given her the seven pounds of grain, give her all the roughage—good hay or silo or corn stover—that she will eat up clean, and she will get the other eight therms. By "grain" I mean any of the mixed feeds—corn-meal, cotton seed meal—any of the mixed grain feeds. Grass I should count as roughage. Having, then, given her all the roughage she will eat, she has all the energy she needs, the roughage that furnishes this energy also furnishing a little protein, viz: About half a pound. Now, then, we can make our grain mixture so that it will furnish the other pound. We can make up a grain mixture that every time it furnishes four therms of energy, will furnish a pound of protein; that will be a 1-4 mixture. Give the cow three quotas of it and all the roughage she will eat, and she is all right.

But the question comes up that I am feeding timothy hay, and the other fellow is feeding alfalfa. Then our mixture will have to be made in accordance with the amount of protein necessary to make up the amount required to produce our quota of milk. For instance, we can use a 1-8 grain mixture. I don't want to confuse you by giving you a whole lot of figures. I simply want to give you the principles, and then you can send for the bulletin and think it over.

We have fed our cow seven pounds of grain, because she is giving twenty pounds of milk. That contains about four pounds of energy; the other eight will come from the roughage; that is the 1-4 mixture.

Has any one any questions up to this?

MR. J. ALDUS HERR: This twenty pounds of milk you are producing, what does it cost to feed? Suppose you use a mixture of silage, cottonseed meal, corn stover and corn once a day?

PROF. VAN NORMAN: I am not a lightning calculator; I will let some one else figure that out.

MR. J. ALDUS HERR: I can't answer that myself; but isn't it possible that a good dairy cow can consume more carbo-hydrates than one of the beef type? I have a beef cow that I must give her corn once a day to keep her in flesh.

PROF. VAN NORMAN: You are a sensible man; you are one of a body of men that are beyond the average; you know your cows.

Now, so far as our experiments show, there is not nearly so much difference between cows as most people think. There is some difference, but not as much as people think. You look after your own feeding?

MR. J. ALDUS HERR: Yes, sir.

PROF. VAN NORMAN: And have you a man you could trust to do the feeding if you were away for six months?

MR. J. ALDUS HERR: No sir.

PROF. VAN NORMAN: Well, that is the point. If you have this rule, you can go away, and be sure that you will have at least nearly as good results as if you were there yourself.

MR. J. ALDUS HERR: Now, we use more carbo-hydrates. We grow corn in our county, and we find it cheaper to feed considerable of it because we know we get better results.

PROF. VAN NORMAN: There are a lot of factors that enter into the question, and which depend upon the individual. I cannot give you any hard and fast rule. Two men will take a pair of horses, and one of them will load up the wagon, and he cannot get started because one of the horses holds back. The other man gets on and takes the reins and starts off without any trouble. Now, that is not the horse; that is the man. So it is always the man behind the gun; but it is safe for the average man to have a rule, and if he cannot use it, he is hopeless. This way we have no weighing out to do; we simply put it on the barn floor and mix it in the proper proportions, and there we have the 1-4 mixture.

The relation of protein and energy will depend upon the roughage we have. If our roughage is timothy hay and corn stover and silage, or any two of these, then we want to make up a grain mixture about 1-4 ½. If we have a good supply of clover hay with the timothy and silage, then about 1-5 is enough protein. If we have the clover hay, then about 1 to 7 or 8; so that our roughage shall determine the amount of grain our mixture shall carry. I have followed this rule, generally. Here is a mixture of 1-5. I simply give it because I have the figures here:

		Protein.	Therms energ.
400	lbs. cornmeal,	28	352
100	“ cottonseed meal,	35	84
300	“ distillers' dried		237
	grains,	66	71
100	“ gluten feed,	20	
		149	744

Now, if you will divide 149 into 744 you will find that the result is practically 5; in other words, here you have your 1-5 mixture. If you want a 1-4 mixture, you can use more cottonseed meal or corn and cob meal both of which are low in protein, and high in energy. Suppose you want a 2-4 mixture, take out half of the cornmeal.

MR. McCALLUM: Professor, is there a possibility that there may be an excess of protein?

PROF. VAN NORMAN: Protein will perform the same functions to err on the side of a little too much rather than a little too little.

MR. KESTER: Can you deduct it from one and add it in with some of the others, as we shifted with the carbo-hydrates?

PROF. VAN NORMAN: Protein will perform the same functions as the carbo-hydrates, but we cannot make anything take the place of the protein. Mud will take the place of the brick, but the brick will not take the place of the mud. The difference between carbo-hydrates and energy is that carbohydrates is something, and energy is what that something will do, so we want a mixture of feed so balanced that they will produce sufficient energy to do it properly. Dr. Armsby in his calrymeter has shown that they mature more rapidly if we do this. We do not figure in decimals because you cannot prove to me that your timothy is exactly the same as I feed, or that your cottonseed meal is infallible in this respect; so we use only the whole numbers, which is close enough for all practical purposes.

MR. J. ALDUS HERR: The only objection I have to that ration is that three of those feeds I cannot grow; I must buy them.

PROF. VAN NORMAN: That is getting off a little bit, but I think it is one of the points that should be considered. If I can buy a hundred dollars' worth of feed and get a hundred and twenty-five dollars back, that twenty-five dollars is profit. Or if I can even get a hundred and five dollars for it, the five dollars is profit. Profit is the only element that enters into it. If you can grow something on a hundred acres that you can sell to better advantage and buy your feed, the only element there is what you can buy to feed at a profit. I think a whole lot of men make a mistake in thinking they can consume what they grow at a greater profit than they can buy feed for and feed it. There is no horizontal rule in this any more than there is in anything else. If you can grow on your hundred acres all the silage and roughage your cows will eat and then buy the grain feeds, I believe you will be doing business at a better profit.

MR. FENSTERMAKER: Why not grow alfalfa?

PROF. VAN NORMAN: That is very good; I am simply speaking in general terms.

MR. J. ALDUS HERR: If I don't use what I grow on the farm, there comes the expense of hauling it away, which means labor. And where am I to get a market for my corn and my fodder and my hay, that I grow on my farm, if I buy the high-priced feeds instead of feeding what I grow?

PROF. VAN NORMAN; Use it.

MR. J. ALDUS HERR: I can't; we grow too much.

PROF. VAN NORMAN: Then keep more cows.

MR. J. ALDUS HERR: Can't; we have reached our limit.

PROF. VAN NORMAN: Here we have one of the factors on which the individual has to work. If you have a small farm, or if you have a large farm, and grow more than you can use, then produce your own protein. There comes in your old-time principle that is so often preached—don't buy your high-priced feeds. I say buy them if necessary to feed at a profit.

A Member: Early in your remarks you advised feeding the dairy cow to the limit of her capacity: what is the capacity of a dairy cow; and, second, is there any danger in cottonseed meal?

PROF. VAN NORMAN: I mean in regard to her health, and to the limit of her health. When she begins to store it on her body, she is beginning to exceed her ability, and she loses in production. Some cows seem to have no limit; you can never give them enough.

A Member: Then you had better sell them for beef.

PROF. VAN NORMAN: That depends; if it is more profitable to sell her for beef, then sell her for beef.

But you must take care of her during her trying time. You never see a fresh cow that is not thin during the first two weeks. She is drawing on her energy, and should be fed accordingly.

Cottonseed meal at the price of the last few years, is one of the cheapest feeds you can buy. If you make a mixture of three or four different kinds of grain, you will never have to use much cottonseed meal. Don't feed any one cow over four or five pounds, no matter what she does. There are some men who will feed six or seven pounds.

Cottonseed meal contains some objectionable product which is deleterious in some cases, but you rarely find trouble with it, so that it is considered practically safe.

MR. YOUNG: Is it possible to make a mixture of three of these ingredients that will do almost as well?

PROF. VAN NORMAN: Yes; but care should be taken to have it, as well as every other ration, palatable. Distillers' grains are light and bulky; the gluten feeds also furnish bulk. You might use wheat bran or wheat middlings and make a balanced ration, but your cows will not like it as well. However, I am talking now to the men who are going out to teach the farmers, and I want to give them a mixture that is as nearly fool-proof as possible. The 1-4 mixture is both safe and palatable to your cow.

MR. YOUNG: These feeds we must buy, and we must buy them in carloads. Still the small farmer cannot use a carload and he must get assistance from his neighbors to buy that carload. Now, if he must buy the gluten feeds and the distillers' grains, he must buy two carloads, but if he can subsitute something else for one of them, he needs buy only one carload.

PROF. VAN NORMAN: Where is your State Grange, and your Cow Testing Association? Why don't these organizations get together and take up these things? I want to say right here that in any community, if five or six fellows get together and go to the feed dealer and say to him "we will take five carloads and unload them at the station if you will reduce your profits," he will have no trouble in getting a reasonable price. I have known feed dealers to take a dollar and a half a ton under these conditions, where ordinarily they would want three or four dollars.

A Member: Where a man is not a dairy farmer, but keeps only three cows, is it possible to raise our own feeds cheaper than we can buy them?

PROF. VAN NORMAN: I believe it is, but I don't believe in this half way business. I would only have one cow to furnish feed to, or I would go into the business in the right way. These fellows with five or six cows don't take proper care of them.

A Member: Corn and cob meal and buckwheat help out on the grains, and they help out on the hay.

PROF. VAN NORMAN: That is a practical matter which applies largely to the individual. What is corn worth a hundred?

A Member: $1.75.

PROF. VAN NORMAN: Now, if we buy a hundred pounds of corn meal at $1.75—

MR. COWAN: Where can you buy that?

PROF. VAN NORMAN: I don't know.

MR. COWAN: Neither do I.

PROF. VAN NORMAN: That is something you will have to work out for yourselves. I am simply using this as a basis from which to teach you fellows to figure. If you buy a hundred pounds of corn meal at $1.75, you have your seven pounds of protein at the rate of—one pound would be one-seventh of that, or 25%. At that rate your protein costs you say $25.00 per hundred in corn; this supplies us 88 therms of energy at a practical cost of 2 cents (1-88 of $1.75) a therm or $2.00 per hundred. Now let us take cottonseed meal. What is that worth?

A Member: $1.65.

MR. COWAN: $1.90.

PROF. VAN NORMAN: All right; $1.90, then. At $1.90 cottonseed meal will furnish, say 35 pounds of protein, at 5 cents plus, or $5.00 for protein. The energy in a hundred pounds of cottonseed meal is 84 therms, or a little over 2 cents a therm. The energy in cottonseed meal is just a trifle more expensive than the energy in corn—$2.00 plus.

A Member: At $1.60 or $1.70 it would be about the same.

PROF. VAN NORMAN: Yes, sir. The thing to do is to figure the cost of your feeds in this way, and then determine for yourselves which which is the cheapest for you to buy, and then select the ones that furnish energy the cheapest. Usually it is corn, or corn and cob meal. Take them; what are they worth?

A Member: 75 cents.

PROF. VAN NORMAN: For $2.20 in oats we get eight pounds of protein—about 27 cents a pound or $27.00 a hundred. That is not quite right; yet we feed them just because we raise them on the farm. Now, we figured out this week in our class that the man who had a hundred bushels of oats which he could sell at 50 cents and haul them into town, and allowed him $2.00 for going into town and $2.00 for going back again, could buy the same amount of energy in cottonseed meal and save fourteen dollars in cash and have eighty pounds more protein. Now I want to emphasize two things: First, what are you getting for what you sell, and next, what does it cost you for what you put back—the same amount, or more? As a rule, at the price of oats in this State, we can better sell them and buy some other feeds. Now, there may be conditions where a man may be justified in holding them. He may have to hire labor, which is expensive. Now, what are buckwheat middlings worth?

A Member: White buckwheat middlings from $23 to $25 per ton. But the cow does not care for it because it is sticky.

PROF. VAN NORMAN: Mix it with something else.

MR. COWAN: Wheat bran or corn?

PROF. VAN NORMAN: No wheat bran for me at $27.00 a ton.

A Member: One member said he raised all his concentrates except bran. Why not raise that?

PROF. VAN NORMAN: Because there is a screw loose somewhere.

Now, I want to review a little bit: The first thing is to feed for maintenance; but the cow is not profitable unless she produces enough for maintenance and milk, so the next thing is to feed for profit, and this can be done by a mixture that is sufficiently cheap, and light and bulky, feeding, as a rule, one pound of grain for each three of milk; or, it may be, one pound of grain for each four of milk; or even, under some conditions, one pound of grain for each two and a half pounds of milk, Now, this is the rule which can be safely followed and it applies to the cow which produces twenty pounds a day, or sixty pounds a day. But now comes the question. How much to give her when she is not in milk? Well, she can live on roughage, if necessary; it is not advisable, but she won't starve to death. Then the next point is to find out at what price the different feeds furnish protein, and use that as a basis for your ration, making a mixture of different feeds for variety. A feed that is too constipating must be avoided and something more laxative substituted. The relation of protein to the energy in that mixture will be determined by the roughage. For timothy hay and corn and bran you will have to use more protein than where you feed clover hay or alfalfa. I believe you can figure out very easily. If not, organize a "Cow Cost Club" and hire a book-keeper to figure it out for you. Carnegie does that, you know, and he would not do it unless it was the best thing to do.

MR. FENSTERMAKER: How about oil meal? Is it too high?

PROF. VAN NORMAN: Well, at the price of oil meal this winter, I would not use it. It is a laxative, but you can get your protein cheaper.

MR. BIDDLE: At the high price of the oil meal this past winter, would not sorghum be a good substitute?

PROF. VAN NORMAN: It is thought to be so, but I would not speak as positively as I would on some other subjects.

MR. GOODERHAM: Up in Cambria, some of the people who were feeding cottonseed meal lost their cows, and attributed it to the cottonseed meal. Those who lost their cows had put little troughs up and let them eat as they wished. Others mixed it thoroughly with feeds and had no trouble. Might this manner of feeding have anything to do with it?

PROF. VAN NORMAN: I don't know. I would not feed over six pounds of cottonseed meal a day under any circumstances, but I have known men to feed as high as twenty.

MR. FENSTERMAKER: Does that include the hulls?

PROF. VAN NORMAN: Sometimes it does, sometimes not. I think a good standard here is about three to four pounds.

MR. GOODERHAM: Mix it with silo?

PROF. VAN NORMAN: It doesn't matter. At the price of hay this last year, the grain feeds have furnished protein cheaper than the hay, and under those conditions it is a good plan to feed as much grain as possible, and as little hay. If you will send for Bulletin No. 114, you will be able to get a little more information on this subject.

DIRECTOR MARTIN: May I have just a word, Mr. Chairman? I want to have a talk with Prof. Van Norman relative to affecting an opportunity for dairy sections of Pennsylvania to avail themselves of a short school of two days, in which they may take up the subject of feeding a dairy cow. Prof. Van Norman has agreed to go into any section of the State where fifteen men will agree to take up the study exclusively for two days or more. Now, I brought out this thought in order that our County Chairmen may take this matter into consideration, and if two or three counties of the State are ready to take up this offer, we will take up the subject and arrange for such schools this coming year.

Before adjournment, Mr. Chairman, I would like to make this announcement: It is our custom to have a Resolutions Committee to act on such subjects as may be brought before it, and I take the liberty of appointing this Committee as follows: Mr. R. P. Kester, Prof. Franklin Menges, Rev. T. J. Ferguson, Mr. S. C. George and Mr. H. M. Gooderham.

The CHAIRMAN: Anything further to bring before the house before closing?

Since there appears to be nothing more, we will now stand adjourned until 1.30 this afternoon.

Wednesday, May 22, 1912, 1.30 P. M.

Mr. F. A. Davies in the Chair.

The CHAIRMAN: The meeting will come to order. All the members will please take front seats, so that if they have any questions to ask, they can be heard. We have been a little lax in starting on time. I think one of the things we should cultivate is starting on time. If it is just as easy for most of us to get here on time, so as not to embarrass the speaker by coming in late, it will be more pleasant for you, and much easier for us. If we are to start at half past one, let us be ready by that time.

The first topic this afternoon is, "Livestock Sanitation," by Dr. C. J. Marshall, State Veterinarian. No subject can be more interesting to the people who are gathered here this afternoon. We are all able to testify to the ability of Dr. Marshall to fill the position to which he has been appointed and the able manner in which he has conducted his duties. We will now listen to Dr. Marshall.

Dr. Marshall spoke as follows:

LIVESTOCK SANITATION

By DR. C. J. MARSHALL, State Veterinarian.

Sanitation means the scientific application of knowledge to prevent disease. Such knowledge may be applied in a great variety of ways. The diseases that are of the most importance from a sanitary point of view are known as contagious or infectious, and are spread from animal to animal or from animal to man.

The losses and suffering from such diseases depends, to a large extent, upon their character, the intelligence, energy and honesty of the citizens in the community in which they occur, and the efficiency of the police sanitary laws, rules and regulations. The losses from some may be controled by the owner himself. In others, it is necessary to put into operation all the powers of State and Federal laws, to check or exterminate them.

It is vastly important that certain diseases should be recognized promptly and measures adopted at once to prevent their spread. This fact was forcibly illustrated. Suddenly, and without warning, Foot and Mouth Disease appeared in Pennsylvania, in eight different places, over an area about 200 miles in length. It was not known at the time that this disease existed in North America, yet it was promptly recognized and reported by the local Veterinarian in every case except one. A carload of cattle, infected with Food and Mouth Disease was shipped to Norristown, Pa., from Buffalo, N. Y., and kept there for one week. They were sick, and a local Veterinarian was called to treat them. His failure to recognize the disease or to call upon the State for assistance, that would have been furnished promptly and without expense to the owner, resulted in a general quarantine being placed upon three counties and nearly 15,000 farms within their borders. All animals on 25 farms were destroyed. It was estimated, upon good authority, that this unfortunate occurrence inflicted a money loss of $250,000, aside from all the worry, suffering and inconvenience that was necessarily caused by it.

Pennsylvania is fortunate in being provided with means for handling the ordinary contagious and infectious diseases, and also to cope with the most formidable ones that have, so far, been given to us by foreign countries.

The State Livestock Sanitary Board was organized in 1895, to protect the livestock interests of the State from disease. Its organization was well planned and the work has been efficiently managed. Each Legistalature has imposed new duties upon it, and provided a more generous appropriation for extending the work. To some, it may appear, that the appropriations are extravagant. The livestock in Pennsylvania is estimated to be worth $133,219,000, according to the last census. It is also estimated that the annual losses to this industry alone from preventable diseases, amounts to $5,000,000. In many cases, the losses fall upon those who can ill afford to meet them. When these figures are taken into consideration, it will be seen that there is much work to be done, and the amount of money, set aside for sanitary police protection against the disease of animals, is very small. It amounts to less than one cent for every two dollars invested. Every possible effort should be made to guard against losses from contagious or infectious disease. Rigid systems of sanitation are the most efficient means at our command for this purpose.

The most effectual plan for combatting disease in either animals or human beings are to be found in an intelligent application of what is known in reference to cleanliness, ventilation, drainage, light, suitable food, pure water and a judicious amount of exercise.

Cleanliness stands next to godliness. As science unfolds her mysteries, this proverb becomes more and more appreciated. Dirt is matter out of place and matter is anything that occupies space or takes up room. It may range in bulk from organisms, that are too small to be seen with a powerful microscope, to nauseating masses of decomposing animal or vegetable matter. At the beginning of the present generation, a surgeon was judged clean by his looks and personal appearance. His instruments could be cleaned with soap and water and dried with a towel or a clean pocket handkerchief. At the present time he could be prosecuted for malpractice if no better precautions were taken to prevent infection. In his case, cleanliness goes farther than can be detected by any of the five organs of sense. This fact has become well known to all intelligent citizens, and the surgeon, who does not know how to be clean in the fullest sense of the term, has no place in modern medicine.

Disease-producing organisms are all too small to be recognized by the naked eye, yet they are often clothed or concealed in filth that can be seen. They belong to the animal or vegetable kingdom. Science has unraveled many of their pecular characteristics in the past few years. In many cases, it is known how and where they grow, how they are propagated and the particular form of disease that is produced by each and how they are or may be destroyed.

In some cases the organisms that cause disease in animals are equally as virulent for human beings and are sometimes carried from animals to man in meat or milk or their products.

Much attention has recently been given to the subject of meat inspection by the newspapers. It is claimed that a large quantity of meat from diseased animals is passed for food by Government meat inspectors. This is true to a certain extent, yet such meat may be considered wholesome and harmless.

When this State began to test and condemn cattle for tuberculosis, about 1895, those that reacted to the test were killed and either buried or made into phosphate. In some cases, the owner would sell the hides, but the balance of the animal was lost. Practically every animal that reacted to the tuberculin test would show, on post-mortem, tuberculosis in some stage of the disease. In many cases, it was so recent or so slightly advanced as to interfere in no way with the general health of the animal. In time, such cases would become bad; they were a source of danger to other cattle, eventually the health would break down and the animal become worthless. It might require years for the disease to run its course.

Those who were most interested in tuberculosis of cattle and best qualified to judge, decided that it was best to kill all cattle that failed to pass a tuberculin test. For several years, the whole carcass was destroyed whether the disease was or was not, far advanced. This custom was not followed in foreign countries where Sanitary science was more advanced. It was considered wasteful and useless to destroy all the meat from an animal slightly affected with tuberculosis.

About fifteen years ago the State Livestock Sanitary Board appointed a Commission of Experts, most of whom were physicians and sanitarians of note, to investigate tuberculosis in animals and report their finding in reference to the use of meat from reacting cattle, for human food. The Commission recommended that meat from mild or beginning cases of tuberculosis could be used safely as food for man. It went into considerable detail in specifying just how extensive the lesions might be before the entire carcass should be condemned. These specifications coincided with the regulation adopted by the United States Government, but were not so liberal as those in use in some foreign countries.

Our present meat hygiene laws were enacted in 1907; since that time, cattle reacting to a tuberculin test have been killed under inspection by a Meat Hygiene Agent or some other regular qualified veterinarian. All generalized cases of tuberculosis have been condemned and destroyed, while those showing but slight lesions or the beginning of the disease, are passed for human food. We feel that this course is perfectly right and that the Bureau of Animal Industry at Washington has been unjustly criticized for passing such meat for food. No country has a better or more exacting system of meat inspection than the United States, and none has more careful, faithful or competent Meat Hygiene agents.

More objectionable features exist in reference to butchering and handling meat, than passing animals, slightly affected with tuberculosis for food. The State has but ten regularly employed Meat Hygiene agents to look after this work in the whole Commonwealth. There are thousands of rural slaughter houses in the State. Local boards of health, in many cases, have driven slaughter houses out of the boroughs and towns, on account of their unsanitary conditions. They have, too often, located in hovels and shacks a short distance from town where sanitary conditions are abominable. The water supply may not be sufficient to warrant cleanliness. There is no sewerage system and surface drainage only, is provided. In some cases, the filthy habit of keeping hogs around the slaughter house to consume the blood and offal is practiced. Many animals are killed in such places that are extensively afflicted with tuberculosis with no inspection. The diseased parts are often trimmed from the carcass, and the balance of the meat sold for food. The trimmings are consumed by hogs, which are very susceptible to tuberculosis, and many of them in turn are extensively tuberculous when killed.

The advanced cases of tuberculous cattle and swine are most often butchered in local slaughter houses because it is known that they may be condemned entirely if sent to the city, where Federal, State or municipal inspection is in force. Buyers are shrewd enough, in most cases, to leave doubtful cases at home. Boroughs and small towns, where no attention is given to meat hygiene regulations, are, for this reason, consuming the poorest class of meat.

The State has been doing considerable work in the last few years on the subject of Milk Hygiene. It was formerly looked after by the Department of Health. Some felt that this, with Meat Hygiene, should be in charge of the State Livestock Sanitary Board. During the past year the duties of the Health Department were very much increased by its being required to inspect the public schools of the State. The Milk Hygiene work was turned over, last September, to the State Livestock Sanitary Board. Since that time its agents have visited over 28,000 dairies and sent reports of their findings to the Harrisburg office. It has been the custom of the agents to classify the dairies visited into one of four grades: Either excellent, good, fair or bad. The excellent dairies are the very best, or those that are known as "certified dairies," or where every condition is ideal for producing and handling clean, wholesome milk. (You can see one such dairy at Mr. Worth Jenning's farm, just below Towanda.) Of the 28,000 dairies reported, but 15 are marked "excellent." The principal reason why there are not more excellent dairies is due to the fact that such ideal conditions cannot be provided for producing and handling milk at the popular price for which it is sold and consumers generally are not willing to pay more. The vast majority of those who buy milk do not realize the importance of the extreme care that should be exercised in handling it. If they did, perhaps more would be willing to pay the increased price for the extra effort.

The reports show that over 2800 dairies visited are bad. The instructions to the inspectors were to mark dairies "bad" only where the conditions were so extremely bad that they would be considered nauseating or a menace to the health of consumers. They are what might be called scavenger dairies. The greater proportion of them are found near the larger cities, yet there are far too many bad dairies in the rural districts. The principle faults are due to ignorance, carelessness or negligence on the part of the person in charge. Cows may be unhealthy and unclean, the stable dark and dirty, no facilities for washing and cleaning dairy untensils and no suitable place to cool or store the milk. It is not an uncommon sight to find a can of milk stored in a pile of horse manure over night, during the winter months, to keep it from freezing. In addition to this, the lid is elevated on one side to prevent the milk from being smothered.

Good dairymen should not be compelled to compete with this class of producers, but they are. One gets no more for milk than the other, and what is the use of being careful or painstaking if it is not appreciated. This is one of the principle reasons why bad milk is being shipped and delivered to consumers. It is why sanitarians are so much purturbed by the milk business. It is also the reason that good milk has to be sold for less than it is worth. This is one branch of agriculture that should be restricted to intelligent, capable persons. Even with our best and most intelligent dairymen the subject of clean milk production is not easy, perfect, or profitable.

A farmer who produces milk for sale, either for local or city market, should be equipped to do the work properly or give it up and allow those to do it who are.

In first-class dairies the cows are healthy and kept clean. The tuberculin test is believed in and intelligently used. The cows are groomed every day so there is no dried manure or filth allowed to remain on them during the milking time. The stables are cleaned at least once a day and the manure is not stored around the stable door or in the yard where the cattle and attendants are compelled to wade through it to get out of and into the stable. The manure is spread on the fields in suitable weather. It has been learned that it is not necessary for manure to lay in the yard and rot before it can be used as a fertilizer.

The cows should be well and carefully fed. A dairy cannot return a profit to the owner where roughage alone or spoiled food of any kind is used. The problem of feeding dairy cows has become a science in recent years and the up-to-date dairyman cannot afford to overlook this important feature.

Too little attention is given to the water supply for livestock. Many diseases and much suffering is caused by polluted drinking water or an inefficient amount. The germs of tuberculosis are passed in the faeces. Where supply is contaminated with the manure from tuberculous cattle, the disease may be readily spread to other members of the herd. Water should be provided in troughs where possible, and wells or springs should be protected from surface drainage. Wells, springs and troughs should be kept clean and shade provided where possible.

The stable should be well lighted. Sunlight is Nature's best disinfectant. Dirt and cobwebs should not be allowed to collect in a stable. The floors, walls and ceilings should be swept and a coat of whitewash applied each spring and fall, at least. Cement floors are especially desirable. If plank or earth floors are used, they should be water tight, smooth and dry. Elevated platforms should be provided for the cattle to stand on, so they can lie down without being soiled. Surface drainage is preferable to covered drains for the stable. The ceiling should be reasonably high, the stable roomy and well ventilated. A good cow stable should be as light and as free from odors as the living room in a good dwelling house. Air and sunshine are cheap but absolutely ncessary in any good system of sanitation.

The above conditions are necessary, not alone for appearance and convenience, but cattle fed, groomed and cared for in accordance with modern, sanitary methods, will live longer, give more milk and return better profits to the owner, than those kept and cared for carelessly.

Bradford county is comparatively free from dangerous contagious or infectious diseases. During the year 1911, 1234 head of cattle were tested for tuberculosis in 83 herds. Of this number, 77 failed to pass the test, and were killed and disposed of under State and Federal inspection. The disease was found in but 18 herds, 78% of the herds tested were found free from the disease. The average percentage of tuberculosis found in the county during the year was 6.25 while the average in the State for the same period was 9.95.

Anthrax, rabies, blackleg and glanders are seldom seen in Bradford county. While contagious abortion is quite common in some dairies.

The State is ready to assist, at any time, ridding your herds of tuberculosis or other contagious diseases that may be a menace to the livestock of the county. It has the authority to co-operate with local Boards of Health in Milk and Meat Hygiene, on terms of mutual agreement. In some sections of the State such co-operation has proven very beneficial.

MR. FENSTERMAKER: We have had this year an unusual number of cases of paralysis among horses, and it usually attacks the best specimens.

DR. MARSHALL: Paralysis in the back?

MR. FENSTERMAKER: Yes, sir.

DR. MARSHALL: That is something that can easily be prevented, although it is rarely curable after they get the disease. It usually attacks the best specimens, and it usually takes them while they are working. They generally work all week, and then stand in the stables on Sunday, and then when they go to work again, they are attacked. In the city, it usually takes them at once; in the country it is not so bad. If they stand in the stable for two days, give them half rations and give them a short walk of about fifteen to twenty minutes—that is, if they are the usual built of work horses, short, chunky, blocky. The thin horse is rarely attacked. Is that your experience?

MR. FENSTERMAKER: Yes, sir.

MR. HOLMAN: Doesn't it usually attack the legs?

DR. MARSHALL: No; it is in the back, about the kidneys. It is caused by the horse getting too much feed for the amount of exercise he gets.

The SECRETARY: Do I understand you to say there is no remedy for it?

DR. MARSHALL: Oh, they sometimes get well of it in the country, but in the city they die. There is not so much of it in the country as there is in the city.

MR. FENSTERMAKER: A great many of them died in Lehigh county this summer.

MR. PEACHEY: Do these horses contract the disease if fed alfalfa, or any particular feed?

DR. MARSHALL: I don't think the kind of feed makes any difference. It is the amount of feed in proportion to the amount of work. It may be some other disease you are thinking of.

MR. PEACHEY: No, sir; the veterinary told me it had nothing to do with it.

A Member: Is there any means of knowing tuberculosis without the test?

DR: MARSHALL: You can generally tell when the disease is in the herd; some of them will begin coughing, and get thin, and when there is one case in the herd, you will be pretty sure to find some more, but to detect every case without a test, you can't do it.

A Member: Would you have the test made regularly?

DR. MARSHALL: If you are breeding high bred stock, I believe I would. Very few buyers will take them without the tuberculosis test.

A Member: Then you would not do it because the city people are clamoring for it?

DR. MARSHALL: No, I don't believe I would, although the local Board of Health may make you do it. It has been done in some cases.

A Member: Is that the case in this borough?

MR. GLOVER: Is there any prevention or cure for abortion?

DR. MARSHALL: We have not discovered it yet. The only thing is to keep the cow clean and disinfect everything, and keep her isolated. Anything you can give her will be of no value.

MR. NAGINEY: Any advantage in a man wholesaling milk to have his herd tested?

DR. MARSHALL: No, I don't think so, unless you find dealers who insist upon it.

MRS. FOULKE: The only advantage is that it would prevent its going through the rest of the herd, is it not?

DR. MARSHALL: Yes, that is the advantage; and I would not want to run a dairy without the tuberculosis test.

A Member: How frequently would you have the test made in order to be sure that the animals are free from tuberculosis?

DR. MARSHALL: Sometimes you test a herd, and find 20% of the animals react from the test; then it is wise to have it repeated in six months.

A Member: If you make the test, is it necessary to repeat it?

DR. MARSHALL: No; not unless you buy new cows. I want to say a word about the water. I have gone out into different parts of the State and found some infectious disease break out which can be traced in many cases to the water. In an adjoining county here where a number of cattle died, I found, in looking up their water supply, a good spring back in the woods which had never been cleaned out, but the cattle ran loose there, and the water was filthy, and these cattle were sick for the reason that they did not have plenty of good water. If this spring had been dug out and walled up so that they could not have polluted the water, they would have been well. That is one of the best ways to pass on tuberculosis. The tuberculosis bacteria passes out through the faeces, and in this way it runs through the herd. I think that if the farmers would dig out their springs and wall them up, and provide good troughs for the cattle to drink out of, they would have a very much smaller percentage of loss and disease among their herds.

MR. J. ALDUS HERR: What do you do when a stream runs through your pastures?

DR. MARSHALL: And others pollute it?

MR. J. ALDUS HERR: Not necessarily; your own cattle may do it.

DR. MARSHALL: I don't know what you can do, unless you bring the water to the stables for them to drink.

MR. SCHULTZ: You mean to say that your herd would not contract the disease unless it came into contact with other diseased animals?

DR. MARSHALL: Your statement is a little strong; there are so many ways that cattle may take the infection—possibly from a neighbors' herd in an adjoining field, so that it is wise to have the test made every now and then.

MR. SCHULTZ: Then if the disease was stamped out in a county, so that it is entirely free, the cattle could not take it even by catching cold?

DR. MARSHALL: No; for the common term "catching cold" has nothing to do with it except to put the cattle into a position to take it.

The SECRETARY: The claim is made by some breeders that cattle would rather drink water that is cloudy—that has a little clay with it, than drink clear water. Has that been your experience?

DR. MARSHALL: No, sir: I think they prefer clear water. I don't think, though, a cow will go out of her path to get a drink if she can get a pretty cold drink right out of her tracks.

MR. DEWITT: Is there any way to make a man dig out and give his cattle a clean place to drink if they have a dirty place to drink?

DR. MARSHALL: No sir.

A Member: Is it a fact that cattle like water that is not too cold better than water that is very cold?

DR. MARSHALL: I think they like it about 70 or 80 degrees better than any other way; I doubt whether they like it when it comes up to 110 degrees in the sun in summer.

A Member: That isn't what I mean. If they are drinking the water from a spring where it comes out cold?

DR. MARSHALL: Yes, sir; I think they do.

MR. BOND: Now, Doctor, I have several times seen the cattle come down from the mountain and pass the clear water, and go right into the muddy water. Is it possible that they are after some mineral in that water?

DR. MARSHALL: That is possibly a depraved appetite, such as the birds eating their feathers and so on.

The SECRETARY: It is possible to find men that will turn from water to drink something that is not as pure.

DR. MARSHALL: And a good deal stronger.

The SECRETARY: I believe that a man like that would be a good subject for the Veterinarian.

DR. CONARD: Suppose a man has a little stream and the cattle tramp in it and defile it, and that herd consists of cattle that are not especially healthy, not tested, no special care taken, and the man right next adjoining is keeping a tested herd, or trying to keep it the best he can under the conditions, has he any redress?

DR. MARSHALL: Dr. Conard and I know of just such a case. We know a man who has a tested herd of Jerseys, with no tuberculosis, and his neighbor has a herd that is at least suspected, and they tramp round in his water. Thirty of his cattle failed to pass the test and he thinks they contracted the disease from his neighbors' herd tramping round in his water. I can't tell him that they did, and I can't tell him that they didn't. We know that the germs pass out in the faeces, and they might not stay in the water long enough to drown. I don't know how he can get redress; there is no law about polluting a stream.

MR. NAGINEY: Is the disease communicable from one farm to another where there is no water?

DR. MARSHALL: Very little starts outside; cattle that are housed, it starts very much quicker. I doubt if two more would take it if they were kept outside. But they come in contact by smelling each other, and through the drinking water.

MR. BIDDLE: Can it be communicated from the adult animal to its offspring?

DR. MARSHALL: If taken away from the mother, the calf can be raised without developing tuberculosis. If left with its dam, it is apt to contract it. I don't know how long it is safe to say, leave a calf with its mother. On the State farm we have a number of healthy cattle that react; we have had some of them six years. Our plan is to take the calves as soon as dropped and feed them boiled milk, and none of them has shown any tuberculosis taint.

DR. CONARD: The cow that has been there six years, does she react?

DR. MARSHALL: Yes, sir; and we have a special eye test, in which we drop it into the eye of the animal, and about twenty-four hours afterwards the animal gets conjunctivitis if she has the disease. I have tried it on a cow that had four tests without result, and the matter ran down over her cheeks in the eye test. Sometimes the first test will not show it, but all of the cattle we have tried so far respond to the eye test.

A Member: Will the human contract tuberculosis by using milk from a tuberculosis herd? It is a question that physicians are divided about. I believe myself that it can be communicated from animals to people under certain conditions. In a large percentage of tuberculosis in children, the germ is the same as in tuberculosis in cattle. In the adult human, it is always of the human type. I drank a good deal of milk from tuberculosis cattle myself without any fear of contracting it, but children who are not well and are raised on tuberculosis milk from the time they are born until they are three or four years old are apt to have bone tuberculosis. I have very good authority from physicians for saying this. That, however, is not a matter for the State Livestock Sanitary Board to discuss. We have enough trouble as it is. That is up to the physician and the State Board of Health.

The SECRETARY: You would not hesitate to advise that where lumps in the udders can be felt, it would be wise not to use the milk?

DR. MARSHALL: Yes, sir. In a good many cases the farmers do not know the disease when they see it. Sometimes, as the Secretar says, you will find it in the udder; sometimes it is in her leg, and sometimes the whole quarter is sore and broken out, and in milking, as you so often see near the city, this puss will run down into the milk when the udder is pressed. Another danger is in the faeces from dirty cattle; usually you will find tubercular germs. Throughout Bradford county you will find many cattle covered with manure, plastered down, and in milking you will agitate this and it will fall into the milk.

MR. HALL: How about the cattle that are kept out doors; are they more susceptible than the human that lives in the air?

DR. MARSHALL: You will find responses in the eye in cattle that are kept out doors, in some cases. I have known Jersey bulls kept out doors to react, and I have known cattle kept in the stable to show proof of tuberculosis. I think farmers make a mistake in keeping young cattle out in the barnyard in winter. It is not well to have them too closely housed, however, if you wish to have healthy cattle. I think if you have an open southern exposure it is well to keep that open. However, that is not in my province. I think Prof. Cochel, who is here, can give you some very interesting figures on experiments made at State College.

A Member: Will they give as much milk if kept out in the cold, as if they are kept warm?

DR. MARSHALL: I doubt whether there is very much difference, although it is generally supposed that it is better to keep them warm. If you let them run out in the cold, or let them drink a lot of cold water, they cannot give as much milk that night, but after you get them used to it, I don't think it will make very much difference.

MR. DAVIES: Cows that are turned out every day, are they not healthier?

DR. MARSHALL: Yes; it is better to give them the fresh air, even if they give a little less milk. Miller and Libby have one of the strongest and best Jersey herds in the State, and they drive them two miles to water every day. They raise unusually strong, healthy Jerseys, and Mr. Libby ascribes it to the fact that they have to take exercise every day. In Canada they are trying the fresh air treatment for tubercular cattle. It is the best treatment for people, and they think it might be the same thing for cattle. But the trouble is that the cow does not live long enough to try it. If she lived to be fifty years old, it might do, but as it is, when she contracts the disease, it is best to get rid of her and get a new cow.

The CHAIRMAN: Dr. Gay not being present yet, we have with us Mr. Evans of the Cork Brick Company, who will present to us for a few minutes, the merits of the article he represents.

MR. EVANS: Ladies and Gentlemen: It has been my pleasure to address some of you before on this subject, which has attracted considerable attention, and is attracting more attention as time goes on. I represent the Cork Brick Company. Our claim is that it is the only practical flooring for horses, cattle and swine. There is absolutely nothing that successfully competes with it. There are materials that successfully compete with it in point of expense, but that is the only point where it has been beaten out, and with it you get results that you do not get with anything else. A floor covered with this is better than anything else, not even excepting concrete. It will not produce rheumatism, as is often the case with cold, stony pavements. It is a material that has been very thoroughly tested, and found superior to anything else as a flooring for both horses and cattle. It is a matter of dollars and cents for your own consideration, but I am convinced, after extensive personal investigation, that you will get better value for your money than anything else will give you.

I do not feel at liberty to take your time, but I have small samples of the brick, and booklets setting forth the advantage of cork brick, together with the names of many users of it, to which you can help yourselves.

During a period of a little over a year past, there have been over a million bricks laid in the United States; one hundred thousand of these have been sold east of the centre of Pennsylvania, including Delaware, Maryland and Virginia. The United States Department of Agriculture has used it, together with a number of other big institutions, and in every case where it has been used, there is no failure which has been attributable to cork brick. In three cases there were temporary failures, the first owing to the manner in which the brick were laid, and in one case it was due to the brick itself. Therefore I would suggest that if any one among you knows of any one in your section who contemplates putting up new barns, or laying new flooring for the stock, that you call their attention to this material which is certainly a time and money saver.

I thank you for your attention, and I appreciate the courtesy you have shown me today.

The CHAIRMAN: Dr. Gay not yet having arrived, I would suggest that, since we have Prof Cochel with us, we shall be pleased to hear from him.

Prof. Cochel spoke as follows:

ADDRESS OF PROF. COCHEL

Mr. Chairman, Ladies and Gentlemen: I don't know that there is an particular subject for me to talk upon until Dr. Gay arrives, but whether I can fill his place or not, I want to say that I have enjoyed immensely Dr. Marshall's talk on tuberculosis. His ideas have been borne out at State College. We have had more tubercular herds at the college the last three years, from which we have not been able to detect any reaction from those kept outside; all the reactivity coming from those that have been kept in the barns.

Now, as to the quantity of milk, I always turn to Prof. Van Norman, who is at the present time conducting an experiment as to the relative merits of keeping cattle outside and in the barn. I believe it has not yet gone far enough to determine in dairy cattle, but in regard to the feeding of meat-producing cattle, when they are well fed, well bedded and well protected from the rain, they are very much better outside than if kept in the stable. But you must protect them from the wind and rain.

At the College they have been conducting for seven year a series of experiments relative to feeding animals out of doors, and the result of five years show that we have secured better results out of doors than indoors; the other two years they were the same. Taking the average, we find that the out of doors feeding is better than the indoors feeding. Two years ago we made a record of all the facts that we got. We found that the cattle fed in an open shed, boarded on three sides, but entirely open on the south-eastern side, and kept well bedded, made a more ready gain at less expense than those kept indoors, and they sold for 15 cents per hundred more than those fed indoors. When we went to distribute the profits, we found there was a net return per bushel of corn fed out of doors over that fed indoors in an average barn, possibly a little better ventilated than the average barn.

In the Animal Husbandry Department, they have taken up the buying and furnishing of animals for the market, and we have found several very striking cases in this feeding. One of these is that the hay made from legume crops, such as field peas and clover and alfalfa, we get very much quicker results with our livestock than when we feed millet or corn. We also find that where it is necessary to use corn, it becomes necessary to add cottonseed meal. We have found, also, that silage is one of the most economical feeds that we can use in the production of beef and mutton. We find, that so far as putting on fat is concerned, we get quicker and cheaper results than where it is not fed. Our experiments show that silage is about the cheapest feed we have.

We have maintained this winter twenty pure bred beef cattle. We have kept them in an open shed, boarded on three sides, and have given them all the silage they could eat, with three pounds of corn and one pound of cottonseed meal. This has been a good winter to make the test, the temperature at times, being the lowest ever reached, and they put on more fat and took care of themselves. When sold to the beef market we found they brought four cents a pound, and when put out to grass they were worth six cents, so aside from maintaining themselves during the cold weather, they increased two dollars per hundred in the market. Part of that is due to the increase in the market, but most of it is due to the animal herself.

Now, the object of this experiment is to find something that will produce beef profitably in Pennsylvania. Conditions have been such that the cattle industry has been driven out of Pennsylvania, in the face of the fact that for the past twenty-five years beef has been the one thing that has shown a steady increase in value. If you divide this into five year periods, you will find each five year period showing a greater increase than the one preceeding it, and the prospects are that this will continue, because the last five years have been the highest.

Now, there are many sections where we can feed cattle and finish them for the market, and it is necessary to look for a source of supply that will prove profitable for a man to feed with. We have found that by silage, which produces more per acre than anything else, and by the use of corn, which is the chief chop we grow, we can maintain our beef cattle as cheaply in Pennsylvania as any other state, except possibly a few Southern states, so we might just as well produce our own cattle, and as good cattle as they are shipped into our Eastern markets from the West.

We have, during this same time reached the highest price for hay. I don't know what it is worth with you, but in our locality it has sold at from twenty-five to thirty dollars, depending upon how much the one man had to sell, and how badly the other man needed it; so we conducted some experiments to determine some other substance upon which to depend for the fattening of our cattle. We have this year fed two carloads of hay, purchased in the stock yards at Pittsburg in November, to two lots of cattle, equally divided, as nearly as possible, as to age, size, and other features. To the one we fed a three-quarter grain ration, and all the silage they would consume; in addition, we gave them two pounds of cottonseed meal per head; the last few months this was increased to a full grain ration. The other lot was given all the silage they would eat, with a two pound grain ration; the last few months we gave them all the grain they would eat. We charged up to these animals the feed used, the silage at $13.50—and your silage yields ten tons per acre—and cottonseed meal at $32.00. The lot that were fed on the heavy feed cost us 70 cents per ton. The corn cost us locally 60 cents per bushel last fall. The other lot cost us locally 60 cents per bushel last fall. The other lot cost us $1.04. In this we made no estimate whatever for the value of the manure, nor for the value of the pork which is usually produced in connection with the steer. The profit from either was greater than the profit from the beef-producing cattle.

The man who is feeding beef cattle from year to year, lives, you will find, on one of the most productive farms in the neighborhood; he sells his crop to himself, and sends the finished product to market. We have come to a point, in Pennsylvania, where we must realize these things. We have a greater market to produce the two year old steer than any other state north of the Ohio River. Our soil, our climate, our local conditions, are such that we can produce him to advantage.

Now, just a word in regard to labor. When we have a considerable quantity of concentrate feeds to dispose of, we find the dairy business more profitable, and where we are farming a comparatively rough farm, with a large percentage land that can be kept in grass, and where labor is scarce and high, there the meat-making animal will fit in very well. The man who feeds cattle in the winter, can attend to his crops in the summer, and thus utilize his time.

But one thing I want to make very plain: the man who wants to go into the production of beef must necessarily make some study of his subject. In the production of meat-making animals which are sold in the markets, rather than to the local butcher, there are conditions which must be studied. Of course, if a man is feeding for the local market, it doesn't matter so much. Our profits depend upon how much we can increase our animals while they are in our possession. When we breed them, the type and quality must be bred into the animal by the man who produces him.

MRS. FOULKE: When a farmer has only a small place and fattens only a few animals, the difficulty with him is to find a profitable market for them when they are ready to go.

PROF. COCHEL: There can be no question of a city market and a good profit, too. We have these in different sections of the State, and can dispose of any animal that will make meat. That is, the demand is greater than the supply. And the prices of the local markets are largely determined by the prices of the central markets. We live fifteen or twenty miles from any central market, but our local market prices are determined by the Altoona market.

MRS. FOULKE: Can you do that with the individual animal?

PROF. COCHEL: Yes; but will find it better to ship in carload lots, because if your local dealer will not give you the price, you can ship them to Philadelphia. If you have only one or two, it will be better to sell them locally, because the freight rates will always detract from your profits. Now, there is another form of market which is in use in this State. While it may not always be under the most sanitary conditions, as Dr. Marshall has pointed out, the farmer can slaughter these animals in the late winter and dispose of them—first, dispose of them as carcasses, rather than the live animal. This gives us three types of market: Slaughtering on the farm and disposing of the carcasses; the other is the market with the local dealer, and the third, is shipping to the central market. There can be no trouble to dispose of meat cattle in any section of the State.

In this connection, I can call attention to one fact, and that is, that Pennsylvania is a roughage-producing state. There is a little area where we are producing crops of grain, but the larger area is roughage.

This is a question that must come up to the farmer of Pennsylvania before long. The solution of the problem is to produce cattle and sheep for the market. Both take on fat on good silage and good grass, and with a proportionately small expense for the concentrate feeds, we can make them fat enough to sell on any market at any time. The greatest trouble that our beef-making farmer has is due to the fact that the animals do not make much gain on grass. I passed through one of the grass-grazing sections of Pennsylvania and I saw two animals to the acre, on the grass; if they are left there until fall, they will not weigh any more than they do now. We find that the winter season is usually the season in which the livestock make the greatest gain.

I think Dr. Gay has come in, so I will yield the floor to him.

The CHAIRMAN: Dr. Gay, I believe, has come in; he will now talk to us on "Horse Breeding and Management." I take pleasure in introducing Dr. Gay.

Dr. Gay spoke as follows:

HORSE BREEDING AND MANAGEMENT

By DR. CARL W. GAY.

Mr. Chairman, Ladies and Gentlemen: The subject assigned me is such a broad one that it might be discussed in a scattering or general way, or it may be summarized under two or three distinct headings; and I prefer the latter.

I would like to discuss that phase of the horse business which pertains to the buyer, and under that heading I would like to touch upon our good friend on the country road, the motor car, and its relation to horse breeding. What I intend to say about the management of horses portains to what is uppermost in our minds at present—the high cost of living.

No breeder has any business to start with a lot of high priced stock. We must know thoroughly where we are going before we start. We must possess a definite idea before we start working. This is true of every business, but I don't know of any subject to which it applies with more force than it does to horse breeding.

Now, there are two characteristics that must enter into the breeders' makeup. They are consistency and persistency. In the first place, he must be consistent. A man must have a definite ideal in view when he starts in the breeding business, and he will succeed if he keeps at it. First of all, we must adopt our ideals, and then we must be consistent in our attitude toward that ideal. A man can be consistent and still not get into a rut.

Then we must study the market conditions, and modify our product to meet these conditions. We have a man in this State who has been breeding a certain breed of horses for twenty years. He has failed to adapt himself to the market conditions and has kept on breeding according to his own idea. His horses have been thrown out of the ring when competing for the ribbon, not even allowed to enter into the lists, and when I tried to tell him why I had to do this, he told me he had been breeding these horses for twenty years and knew more about it than I did. He is breeding the Shire horse, and is producing the old-fashioned, gummy-legged, monstrous, coarse kind, that don't go today.

After type comes quality. It don't matter whether a horse weighs twenty-four hundred pounds, or whether he weighs twelve hundred, he must have quality. If he doesn't, the market will not accept him. This man started breeding these along these lines twenty years ago. He is consistent, but he can't sell his colts, and he can't win with them in the show ring. He is an outlaw; but he has gone so far that he can't go back. So we must not only have an ideal and stick to that ideal, but we must adapt it to the market. We can be consistent and still deviate a little from the course on which we have started, in order to meet market conditions.

With the introduction of the motor car, we have heard a great deal of discussion pro and con as to the relation of the auto to the horse and the horse breeder. Some of the talk has been extreme. Up in Vermont, Col. Battell objected to having a motor car on the public road in his neighborhood; so he got up a bill prohibiting it, and had political weight enough to have the bill carried. It may have been revoked by this time, but when a couple of years ago when I was up there, this was the case; you could see no automobile on the road leading to his house. There were no autos allowed on the road. But in spite of all opposition the auto has come, and it has come to stay. I know that our horses shy at it and it wears out our roads, and raises a dust, and all kinds of things of that sort, but we may as well face the fact that whether we like it or not, it has come to stay, and it has brought about a new condition. But the case is not lost, so far as the horses is concerned. It is simply a matter of competition which we must face, and what we want to consider is this matter of competition We don't want to throw up our hands and consider the case lost, and when we meet these extreme specimens we want to be able to meet them with an argument regarding the economical use of the motor vehicles in emergencies, etc., but if you take all things into consideration, I think you will find the horse is still of use.

Look at history, and it is full of just such instances. In early times the horse was used chiefly for war. If you will look about you, you will find that from the fourth to the eighth century the horse was used principally to carry his master to battle in the wars which were constantly being waged. Then came the invention of gunpowder, and it was supposed for a time that the horse had been forced out of business. The war horse of that period was very much like the draft horse of today. He had to carry at least four hundred pounds, because of the heavy armor in which his rider was encased. But the charger didn't go out of business; he was simply turned to other uses.

The horse that made the percheron famous was simply the evolution of the old stage horse that worked in groups of four to six, pulling the old stage coach out of Paris into the country at an eight mile an hour gait before the introduction of the railroads. But with the coming of the railroad into France, these horses were not needed, and the farmers of La Perche realized that they have to do something to compete with the railroads if they didn't want to get out of business entirely. They also realized that the railroads would develop agriculture and commerce, and so they set to work to produce a little different type of horse—one that could be used in the city and the farm, and they made the already famous horse more famous by producing the Percheron or draught horse.

The same thing happened in this country when the horse car was superceded by the cable car, and later by the trolley or electric car. The cry went up that the horse would have to go out of business, but he still continues to flourish.

It is the same thing today with the auto. I am a little of an optimist, but I think you will find that I am right. Why can't we look back and see what people have done in the past and do the same thing today? Let us look for a moment and see what types of horses are affected by the motor car, and then if there are any, is there any type that is being created by the motor car?

We must consider that it is not a case of "hosses is hosses." There are distinctive types of horses that are in use, in different lines of service. One type is used along one line of service, and another type along another line. When a man goes to market, he has in mind the different types of horses he wants, and not simply "horses."

There are five of these general types of horses: Work horses, running from 1750 pounds up; heavy harness, light harness, saddle horse, and pony. We will include the pony. He is in a class by himself, and it is a class that is beginning to be recognized. Now let us analyze these types as they affect the farmer and as they are affected by the auto.

First on the list is the draught horse. He has no business on the farm; his place is in the city where he is used to haul heavy loads on the slippery pavements. If you mate one of these horses with a ton stallion, you will do well to get a ton foal, because the type has a tendency to revert to the original. This is a good horse to breed, because there never will be a glut of draught horses of two thousand pounds weight. The demand, from present indications, will always be in excess to the supply. He is like the race horse; it takes a good deal of money to get a perfect type. His business in the city is to haul heavy loads from the station to the warehouse, and he must be able to get in and out and move slowly. He is a heavy horse and works best under a heavy load.

Then we have another type—the chunk. He is the contractors' working horse. When excavating or working on a railroad, the chunk is used to carry out the dirt, and he goes up and down the embankment with ease, drawing his load. Can you imagine a motor truck adapted for this? I can't. I saw the other day where one contractor in New York has ordered five hundred head of chunks, to do some excavating work.

For these two types there is very little competition. They are not affected by the auto to any perceptible degree.

The third type of worker is the expresser. This is a horse that must be light and able to draw a pretty heavy load quickly. Now, there is a keen competition for that horse. He is used for delivery purposes, and with him the motor is a kneen competitor for two reasons—speed and popularity. Now, wherever speed is a factor, you will find the motor takes the place of the horse, particularly for delivery in the outlying towns. Then again, the motor is popular. Quite a lot of people take a lot of pleasure in having a lot of furniture unloaded from a motor belonging to one of the big stores, in front of their door. This is particularly so in some of the outside places. Now, this is a horse that has come into competition with the motor for the simple reason that he is a horse whose existence depends upon speed and upon style.

The heavy harness horse is another proposition. He is more or less of a pleasure horse. We have the heavy harness horse to use in the Broughham when we want to drive in the park. The coach horse has been hit just as hard as the expresser. If you will go to the city, you will find motor cars where you used to find coach horses. But even here the reaction is beginning to take place. The "four hundred" of New York are returning to the Brougham and horse instead of using the motor, because the motor is no longer a distinguishing feature of wealth. They are becoming common, and no longer attract the attention that a finely appointed Brougham and horses do. As a matter of fact, I talked to a man the other day who has just sold a pair of coach horses for $2,800.00 and he said he could sell them right along at fancy prices if he could get them perfectly matched. But that is the trouble; it is hard to find a perfect match.

The park horse is entirely a show horse; he is used only for pleasure, and he has come forward wonderfully the last few years, and the readiness with which this horse is picked up is not an indication that he is going out of fashion. He is used by the ultra-fashionable people of wealth, and the more the motor car is used and the cheaper it becomes, the more this horse will be used by them. When anything becomes cheap, they cannot use it, and there is nothing that will attract more attention than a finely appointed Victoria with a pair of fine horses attached.

However, in spite of all this, there is no doubt but that this type of horse is more or less affected by the motor. A gentleman who used to have sixty head of horses in his stable and drive to the city every day in a four-in-hand, today has only a few old pensioners and rides to his business in the auto. He told me that he prefers the horse, but fashion demands the auto, and he can make better time in the motor. Wanamaker's manager told me recently that in their service the motor was going up, and the horse was going down because people are asking for delivery by motor, but as soon as the fad is over, they expect to go back to the horse as being more reliable and more economical. One firm in New York has already gone back to high class horses. They find them more serviceable and more economical. And it is the same with the coach horse. As the motor becomes more generally used, the coach horse will come back to his own.

Light harness horses are used for two purposes: Harness racing and road work. Some of you know that harness racing is not dead by a whole lot. The prices asked in New York are not as good as usual this week, but the prospects are better. But, as a matter of fact, the road horse has been hit harder than any other horse. With the man whose business depends upon the ground he can cover, the auto has taken the place of the road horse. Take for instance, the doctor whose business depends upon the number of calls he can make in a day. He has adopted the auto as a matter of expediency. I, myself, as a horse doctor, use the auto to take me from the country to the city, and I must admit it is a pleasant sensation, speeding over a good country road, and knowing you will reach your business quicker than by any other mode of travel. To a certain class of business and professional men, the auto has become a necessity. It enables them to live out in the country and still do business in town, and to this extent it affects the road horse.

Next, the saddle horse: Where it has borne down on the coach horse, and had a depressing effect upon the market value of the road horse, the motor has been one of the factors in bringing about an opposite effect on the saddle horse. The saddle horse today is enjoying a degree of favor that he had not enjoyed for years. Dealers simply cannot supply the demand: the prices are extremely high. Only last week one sold for thirty-five hundred dollars. People are paying scandalous prices for the saddle horse today, and they are the men who use the motor cars, too. One will ride for his liver; another because the doctor tells him to do so, and for that reason the saddle is in demand. It gives a man the exercise that he does not otherwise get, in many cases.

The motor is quite a factor in the "back to the land" movement. You know that out in Kansas, for instance, the motor car is very largely used in the country, and the Ford people have reduced the price of their cars so as to put them within reach of almost everybody. It is a hugh social factor too, and will enable a man to get into the country from his business in the city, in twenty minutes, and it is a factor in country life. And anything that will affect country life will have its effect on the horse business.

There never were so many people riding by doctors' orders, or so many people who ride in the parks, and so, while it has had a depressing effect on the coach horse, and the road horse, the motor has boosted the saddle horse.

Now, ponies. They are coming. To the boy, the auto does not come into the same family alongside the pony, and the pony for the children, in the country, is coming more largely into use right along, and with him the auto does not enter into competition.

Now, then, to sum up the matter of competition between the horse and the auto, I think it resolves itself into this: No matter how many motor trucks are used in the State, we have no reason to believe that they will become safe and efficient enough to dispossess the high class draft horse, and the demand, at the present time, is so far in excess of the supply, that there seems to be no possibility of glutting the market by overbreeding this type.

The Chunk: We cannot look far enough ahead to be absolutely certain, but it does not seem possible to substitute a mechanical thing for him.

The Expresser: We can see that the motor truck is better for driving a great distance with a heavy load.. For about town delivery, you cannot get as much service out of a motor. They get better service out of a horse. Frequent stops rack the car, and the wear and tear of the motor car makes the horse more economical for this purpose. The deduction would seem to be clear, that for long distance runs, and to meet the popular demand, the motor is best; while for city delivery with its frequent stops, the horse gives better service. And to this extent this type has been affected.

The coach horse has been hit; but it is a question whether he is going to stay down.

In light harness horses, the road horse has been harder hit than perhaps any other. I don't refer to the trotter, because you can make a trotter out of any type of horse except the draft horse.

For the saddle horse, business is better than before, as the direct result of the motor car.

Now, then, the breeders' duty becomes plain. Breed the type that suffer least from competition. I would not advise any man to go out of the horse breeding business if he is in it, but I would advise him to read the handwriting on the wall, and to direct his efforts in accordance with his best judgment.

Now in regard to management: I said our subject was to be the high cost of living. With hay and corn and oats at present prices, about the most frequent question I get is: "How can I cut down the cost of my feed bills?" Now, to the man who is running a high class stable for pleasure, it is not so important, but when you are on the farm, and have two, three or four hundred horses to maintain, you will see that this is quite an item. The question is how may we reduce this cost. We have a standard, which, of course, is oats and timothy hay, and, generally speaking, we can't improve upon these for various reasons. The first is, the oats are almost a balanced ration in themselves, and so far as the roughage is concerned, it comes in the form necessary to produce digestion. It is almost impossible for the horse to eat oats enough to do this, so the hay becomes simply a filler. He doesn't get enough to eat from the oats, so he gets the roughage to fill up, and to get his digestive organs working. So we must have a filler that will keep him in good form. Timothy hay does that better than anything else, but with hay at $30 and oats at the present price, it is almost prohibitory.

The first substitute for oats would naturally be corn, but to many of us that naturally suggests trouble, because corn is apt to produce indigestion. I lived for six years where they got little but corn, and horses were fed corn and colts were fed corn without any resulting indigestion. I will tell you one reason for that: the condition of the corn. It is all first-class corn and fed in the cob—sort of an original package. Shelled corn takes on the smell of the gin in which it is kept, and the horse is guided largely by his sense of smell. There is little trouble in feeding corn in the cob to a horse. If you shell it, and let it lay around loose, it will begin to smell of the gin, and the horse will not like it, but if you feed it to him in the cob, there will be little trouble with him on that score. The only trouble in keeping a hundred head of horses and feeding them corn in the cob is the matter of the storage of the corn, but there is no reason why it should be fed exclusively. A ration of one, two, three,—corn, oats and bran, is all right, and it is probably safer than an entire ration of corn. This has been an unusual year for corn; they talk about dollar corn; but I would like you to consider the matter. It is the most economical and healthful substitute. Hay will be the most expensive feed you can find, and if you experiment a little with the corn, you will find that your price of feed will come down very materially. Then bran. It is pretty high, but is coming down to normal price, and it is a very good substitute for oats. Bran is one third of the corn ration, and at the Experiment Station it has been found that there is no more satisfactory substitute for oats than bran. Wheat is not good, but bran is very satisfactory.

A Member: How about rye?

DR. GAY: There has not been much done with that so far as I know.

A Member: Is it poison?

DR. GAY: Yes, and there is not much work being done with it. On the Pacific Coast they feed considerable barley, and the Arabs use it almost entirely. You could use a little more barley than oats, even if it has to be crushed. In California and on the Pacific Coast they use it both as a concentrate and as a hay.

Dried brewers' grains—which is the dried corn after the malty substance has been taken out, made into a mash, and used pound for pound for oats, make a fairly good substitute. We can see no difference in the amount of work they do nor in their health, and these grains are much cheaper than oats. Malt sprouts and distillers' grains are not so good, and cannot be fed to good advantage.

MR. DAVIES: Do your remarks apply to colts?

DR. GAY: No: I had in mind the working horse.

MR. GOODERHAM: How much molasses do you use?

DR. GAY: Usually about a pint to a thousand pounds.

MR. HOLMAN: How about ground oats and alfalfa?

DR. GAY: If you are sure what you are getting. Take H. O.—Howley's Oats—for instance; they, and concerns like them, have an enormous demand for the oat hulls, and it is known that these patent feed people are the consumers of these oat hulls. Now, if after an analysis you find it is all right, you can use it that is all right, but you will find that you pay a little more than if you buy the oats themselves, if you consider the amount of protein they contain in proportion to the price. There are some feeds on the market which are dear at any price, because they are poor in protein.

Field peas—these do very well. In Canada they feed a good many peas, and the thrifty Scotchmen use a good many of them. They are very rich in protein, and if fed with bran or oats, or something of the kind, they can be fed so as to do no harm to the horse.

We don't like the malt sprouts or distillers' grains. Dried brewers' grains do very well; but, on the other hand, the Associated Brewers of California, who are working in the neighborhood of three hundred and fifty horses, would not feed their horses any of these grains, but they will sell them to some one else to feed. At least they did five years ago, when I knew them. I think it was prejudice, because we have not found that they do any harm.

Now, the matter of molasses. About the first extensive feeder in the country to use molasses were the Arbuckles. They worked it out, and I found that the price usually quoted was from 10 cents to 15 cents per gallon—a little cheaper than you can get an ordinary farm molasses at from 10 cents to 11 cents per gallon.

The SECRETARY: The last I had was 10½ cents by the barrel.

DR. GAY: At 10 or 12 cents up to 14 or 15 cents it is economical to use it.

The SECRETARY: I get the brewers' grains from a concern in Johnstown and a little buckwheat and some middlings, and then I cut a lot of straw and add it as needed. The molasses is boiled up with water, and mixed afterwards. It makes a sticky mess if you use it as it reaches you, and the horses do not seem to care for it.

DR. GAY: The usual way is to feed it clear, but it makes a mussy stuff especially in fly time. It is better boiled, and you should get better results if you cut straw and mix it.

The SECRETARY: It takes a good deal less hay.

DR. GAY: During the present year it was cheaper to feed more grain than hay. One of the best substitutes for timothy is cereal hay. You take the hay made from oats and peas and you will have a better product than timothy hay, so far as nitrogen is concerned, and it makes a very cheap and satisfactory substance.

Another thing that we don't appreciate is the corn stover. I have seen lots of it out in the field in the last two years, and yet only recently I know of a record sale of 16 cents a bundle for it. Lots of men don't think of using it for feed, but it is a good thing.

A Member: How much will you reduce the grain ration when feeding the cereal hay?

DR. GAY: Well, I would reduce it a little, but not very materially, I believe.

The SECRETARY: Must it be brought home and dried?

DR. GAY: It can be put up in shocks outside, if you prefer this way. Hayward told men on our farm the other day that he would never think of using alfalfa so long as he could grow cow pea hay. There is a common theory that legume hay is not good for horses. I was a student at Cornell under the most ardent advocate of this thor. It is claimed that it will produce heaves, but it is question in my mind whether mixed hay has very much to do with the heaves. We do know that in a locality where it is grown, they are troubled with the heaves, but it is necessarily due to the hay. There may be other causes.

So far as alfalfa is concerned, if I could buy alfalfa hay grown in Utah at the same price as timothy hay here, I would use it. It contains three times as much protein, and is almost perfect ration in itself. I buy it nicely put up in bundles at $26.00 in the car. The second lot I got was $29.00 almost the same as timothy hay is costing here, but to my mind it is worth the price, because it is a perfect ration. We have fed this alfalfa to our horses and to our dairy cows, and I don't know of anything that is better than alfalfa, if you get the proper kind.

The Iowa Experiment Station has done some work with cottonseed meal, and they find it more economical to feed 10% cottonseed meal for their range than to feed all corn and alfalfa. As they use it in Iowa, they found they could feed a little over a pound—a pound and a tenth, to be exact—of cottonseed meal, with good results, and very materially save their corn. Linseed meal didn't do so well. It was too much of a laxative. But their experiments seemed to show that cottonseed meal was all right.

MR. GOODERHAM: You can feed up to a pound and four tenths without harm.

MR. COWAN: You don't say anything about wheat.

DR. GAY: That is a coliky thing to feed horses. There is a possibility that alfalfa and clover will cause heaves, but there is no doubt that wheat will cause colic. Of course, wheat has been used, and it has certain value, but it would only be of value where the price is very low as compared with other horse feeds.

The SECRETARY: I have found the whole wheat to be a laxative.

MR. COWAN: I have never tried the whole wheat; we have nothing but the wheat middlings and bran, and I make a mixed feed, the same as with the brewers' grains, and it does very well. I never feed any oats.

PROF. COCHEL: What about silage for horses?

DR. GAY: Prof. Cochel can tell you about that better than I can. We have been feeding it, but I do not advise it, because there is a prejudice against it. Take millet: Prof. Cochel can tell you something about that too. It has been absolutely dropped because one man used it unsuccessfully in North Dakota about ten years ago, and told everybody about it, while the people who have used it without harm haven't said anything about it. Now, the same thing has been said against silage. It has caused the death of a great many horses, and, on the other hand, a great many horses have done well on it. I would like Prof. Cochel to tell us his experience with it.

PROF. COCHEL: We have fed a considerable amount of ensilage, and have done it very successfully with our working horses. We have conducted one experiment in which we fed up to 20 pounds of ensilage a day without injurious results. The silage, however, was sweet and we were very careful not to feed him any more than that. If you are certain it is a good silage and you have a good man feeding it, I see no reason why it should not be fed, but where a careless method of feeding is employed, or where enough is thrown down one day for two or three days, I wouldn't use it.

So far as millet is concerned, when we feed it in such qualities and in such a manner that the horses won't eat the heads of the millet, we have never had any trouble with it.

A Member: I buy the Japanese wheat seed with the heads threshed out.

DR. GAY: Now, gentlemen, it has been a big subject, and I have had time only to give you a rambling talk, but I want to start you thinking how to find a more economical means of production. It is just as important to produce at a low cost as to sell at the highest price. If you can't get a margin on the selling side, you do it at the other end, and reduce the cost of production.

A Member: Doctor, what is your idea as a business proposition to raise mules?

DR. GAY: A very good one, but I wouldn't advise the farmer who doesn't know anything about it to go into the business without a visit to Missouri or Tennessee. There are certain things that will sell a mule, and certain other things that will keep him from being sold, and it is wise to learn beforehand just what these things are. I was in Tennessee last summer, and the mule show I saw there was a revelation to me. It takes a negro to know how to handle mules; the white man somehow does not appreciate the dignity of the mule as the negro does, except, perhaps in Kentucky, where the mule has the same dignity as the horse.

In breeding mules, you have your mare to consider. The theory that any old mare can produce mules is wrong. In the South they use brood mares to produce mules. Then you have to consider your Jack, and see that he is all he should be, because our mule is sold largely on faith. You have to sell the mules as (ringlies?) and they live to be sixty, seventy, eighty or ninety years old. No one really knows how old a mules lives to be, because none is ever known to die.

You can sell an old pair of mules, if they have no unsoundnesses, where you can't sell an old horse. The mule will work where a horse will lie down. Who ever heard of a mule giving up? There are a lot of things to be said in favor of the mule, but some other man probably knows more about it than I do.

DIRECTOR MARTIN: Will you please describe a type of draught horse for us?

DR. GAY: Now about the draught horse: the first thing is the weight. Some men consider 1400 pounds as being a heavy horse, but in Chicago he would not come into the draught class. He must weigh at least fifteen, sixteen, or seventeen hundred and fifty pounds up to 2,350 or 2,400 pounds. If you have been accustomed to a 1,400 pound horse looking big to you, you can hardly conceive what these horses look like. These horses could not go in and out of these doors here.

The outlet for a first-class draught horse is the city and not the farm. People will pay four to six or eight hundred and even up to fifteen hundred dollars for a pair of them, but the farmer can't get enough out of a horse like this to pay such a price for him. His work is in the city, where he has to haul heavy loads over the slippery pavements, and make his way in and out of the crowded streets. He should be low, and have the weight to pull a heavy load, and straight, to the back rib. It is simply a problem in physics. He must be heavy so as to pull a heavy load.

The SECRETARY: The same as a heavy engine.

DR. GAY: Yes; in the first days of railroading, the railroads thought the light engines would be better to pull the heavy loads, but experience taught them their mistake, and they have finally come down to heavy engines.

Second: He must be low down in his legs—short-legged. Many people think the longer a horse is, the longer he can draw. This is not a fact, and for it there is a reason, and a very good physical one. You know your power is greater as it is closer to the ground. Take the handling of a pitchfork or a crow bar, as an example; by getting lower down on the handle, you get a firmer hold, and more power to use it. The horse is built on the same plan, and the lower the centre of gravity is, the more power, and the more speed possible. Then there is another reason: the long legged, long backed animal will have long ribs and be light in the thighs, by the law of co-relation.

Then after being low-set, the horse must be wide. Why? Because you need a wide base for him to stand on. You must increase the base of support to increase the stability of the equilibrium; it is simply a law in physics.

Then he must be deep in the middle; not so deep that he gets into his own way; but the middle is the power plant, where he generates his power, but it must be deep enough for him to generate it.

Then he must be chunky. You want him short in the back because his generator is in his hind legs. You stand on your toes, and you have the same thing. The shorter the distance, the less loss in transmission; the longer the distance the power must be carried, the greater the loss. You take this long-backed horse, and you will find he does not carry his load with the ease of the shorter, more chunky one.

Then you must have a bony frame work that will take on muscle. There must be muscle development in order to have strength. Take the draught horse; it has a muscle like the Poland-China. In order to support this muscle, we must have a good bone; but I think most men are too keen on the bone. You want a hard, clean, flinty bone, one that will not give or crumble under the weight of muscle, even if it does not measure eleven inches around the knee-joint. It is like chuck steak—considerable in the chest; it does not depend so much upon the size of the bone, as on the texture of it.

A Visitor: I am not a member, but may I ask a question? As I understand it, you advocate heavy draught horses because they do not slip on the pavements in the city; also, you advocate a low draught horse, as I understand it. Now, is a fifteen hundred draught horse that stands fifteen hands high better than a horse of the same weight that stands seventeen hands high?

DR. GAY: That is either very high or very low for a fifteen hundred pound horse; but I think the low one would be rather the better.

A Visitor: You may be right; but I was raised on a farm, and we always tried to get the horses so that they lifted a long pull, to prevent their sliding. I only want to suggest this, so that it may be thought over.

DR. GAY: You think you would get more lift with a longer leg?

A Visitor: Yes, sir.

DR. GAY: Of course, you can get a horse too much on the Dutchman's order. But you take a pair of mules out in the field, and they can out-pull any horse; take them on the street and they cannot move the load that the horse does. Why? Because the mule is long-legged. He is not as well adapted to move a heavy load as the horse is. You put the mule in a heavy pole wagon on the street, and he is no good, and here is where the work of the horse comes in.

The CHAIRMAN: Anything to come before the convention at this time?

MR. KESTER: I would like the members of the Resolutions Committee to meet me here immediately at the close of this session. The members of the committee are: Messrs. Kester, Menges, Ferguson, George and Gooderham.

The CHAIRMAN: If there is nothing further, we will now stand adjourned until 7.30 this evening.

Wednesday, May 22, 1912, 7.30 P. M.

Mrs. Jean Kane Foulke in the Chair.

MRS. FOULKE: I don't want to take up much time with remarks by the presiding officer, but I wish to say what all the others who have preceded me have said—it is a great pleasure to me to be here. I have been here twice before, and in Bradford county, last winter, so you see that I must like it.

I am not going to talk long, but I want to say a word in reference to the program this evening. With one exception, the speakers are women, and I like it because it represents the woman in the Farmers' Institute. I want to say to you that I believe the work of the women is almost greater than that which the men can do. I say that for several reasons'. In the first place, the men have been at it longer, and I have found that the work among the rural women is really greater, and it is a work that the men have not reached. I want to say to my sister workers here, that I do not think you can put too much interest in you work, when we realise how few workers we have in comparison to the magnitude of the work. In order to do the most good, we must put our whole hearts in it. There are tremendous opportunities before us, and I hope that as time goes on, Mr. Martin will see his way clear to add more women to the force, to increase our efficiency, so that every time a man goes out, to an Institute, there will also be enough women who are strong to go out and do that work, no matter how hard it is, because there is a great field for us.

This evening we are going to have some of the new members of the force. As I understand it, they have been at work in other places, but not in Pennsylvania until this last winter, but they have done such good work that Mr. Martin has selected them to show us older workers how to do things. It gives me great pleasure to introduce to you Miss Burnite.

Miss Burnite spoke as follows:

HOME HYGIENE

By MISS MARY A. BURNITE, New York City.

"The worth of a State," says John Stuart Mills, "is the worth of the individuals composing it"; therefore, we must encourage individual homes, and discourage humanity living in large groups. It destroys individuality. We plead for more and a larger faith in individual men and women; boys and girls.

The Home, the most sacred of all our institutions, marks the beginning and progress of all our civilizations. The Home represents the economic pressure of the woman and the man of her group; that is, each special group has an economic pressure peculiar to itself and the safest means of securing harmony is by affiliation within a given group. This same pressure, however, is preventing the establishment of our homes on the one hand; and interfering with their proper management on the other.

Home composition is father and mother; but a complete home is a happy family. Home is the institution from which we draw for all phases of society; yet we are just beginning to be willing to subject these home problems to a calm and practical analysis. Our deepest and our most sacred memories are bound up in our homes. Within the past few years, however, there has been a great change in the attitude of the intelligent men and women concerning the problems of home and family; both from a personal and social standpoint. Investigations have been conducted; reports are being given, and earnest discussions entered into, with the result that there are healthful and hopeful evidence of the acceptance of the scientific spirit and methods leading to the proper emphasis where it belongs. Schools are studying the Home, but we need to go further than they do. We want to turn the searchlight into our hearts, and by a calm consideration of the facts, arouse in every young man and young woman a sense of the dignity of our homes. We want to emphasize the enormous social service where the home has rendered the value to our own individual being.

What constitutes a home as a resident? Well, it's a house shaped by our men, architecturally speaking, and it is said the house moulds the lady, and The Lady is one with a high physical courage who ideally begets tenderness for suffering; let no one misunderstand: the term "Lady" is always embraced in that bigger term "Woman."

Legally, the home is "a house with all of the appurtenances belonging thereto." From our domestic view point we must consider the hygiene of the dooryard; hygiene of the house construction; hygiene of our sleeping apartments; hygiene of our kitchen, where the very elements which enter into our bodies and which become a part of our very being are prepared; hygiene of our dining rooms, where there must always be mirth and freedom from care during the partaking of our food; hygiene of our living rooms, where is the place of family gathering for council, prayer, and the social order of things.

What is Hygiene? It is described as the science of perfect health. Hygiene is the science of the perfect co-ordination of all the parts of our organism. Hygiene, in the modern term means cleanness. Cleanness of person, cleanness of clothing, cleanness of surroundings, cleanness of good, cleanness of purpose; soulfulness. "Now if you know these things, happy are ye if ye do them." We are also told, "He that knoweth to do good and doeth it not, to him it is sin." Now knowledge of itself does not make morality, and my bringing you this message for better living, yes, for right living, remains entirely with you to the value in your own homes. "A little learning hath made thee mad," and you know "a little knowledge is a dangerous thing:" all of which signifies that we do not truly *know* until we have made this knowledge a part of our own daily lives. This cleanness of soul is but another way of saying that virtue emanates from within. I want to re-emphasize that this knowledge of cleanness availeth nothing unless it is truly transformed into terms of better living; terms of altered attitude toward life; altered motive power in our living; until we transform this knowledge into an individual problem that we may guard our homes with nothing less than our whole lives; our whole being.

Hygiene means the preservation and improvement of health. Cleanliness of the individual, cleanliness of the community; cleanliness of the State. Then we have Public Hygiene; Industrial Hygiene; Occupational Hygiene; Moral Hygiene; Sex Hygiene; and all these should be controlled by this great institution, the home. Our homes remind us of the one-celled organisms, like unto which we ourselves are: i. e. the Ameboa; the family by its sons and daughters, divides, each going out and forming homes of their own, and each in turn establishing these homes to be divided and redivided again and again. All this reminds us of the composition of our very own bodies, which we know is a complication and succession of cells; from the lower plants and animal life, we know that each cell divides into two; each two into four; each four into eight; each eight dividing so that we have sixteen, etc.

Through biology and bacteriology we know much about disease and its causes, which is generally established in filth of some form; through these sciences we know that our skin is composed of millions of cells; we call it tissue; we know the bones are of like cells; we know that the blood is a tissue; we know about the various nervous systems and much of their functions; we know the glandular mechanism to the hundred and many of their secretions; we know how our food digests; what foods are best adapted to different constitutions, under different circumstances, in order that perfect health may be attained and maintained; we know much about how our food is burned in the body; that it is burned at a lower temperature than such food outside the body; we know how much food is necessary to maintain life, to be nutritive at different ages and in different climates. All this knowledge is within the province of home, and belongs to the home. Our civilization has brought us many blessings, but it also brought out of the distant past a barbarous contempt for the value of human life. We take greater care of our animals than we do of ourselves. Our chickens sleep in open front houses; our cow-stables have windows which are opened; our children sleep in the smallest room in the house, the windows closed and barred, the door shut and locked, so that no out-of-door air whatever may penetrate through these precious human lungs.

This is principally thoughtlessness. Some one says "the best antidote for heedlessness is thoughtfulness." It certainly is *faith* in something, faith and enthusiasm in something which makes life worth living. Let us make this ideal our own. Human bodies, with all things else affecting the same: let us know *ourselves*. Let us consider our own health and that of our children and make this consideration paramount—above all else.

Our first thought will be for the physical; our second thought will be for the mental; our third thought will be for the moral. *Or*, better still, all are so closely bound together that you can't have any one of the three perfect without affecting all. You cannot have any one of the three out of harmony with *Nature* without likewise affecting all three.

Another division may be made: I, Heredity; II. Environment. Heredity is an uncontrollable environment. Before birth, and the long infancy of human beings gives an extended period of uncontrollable environment. How it behooves us to guard these periods and all phases of life touching the same—for this generation and generations yet to follow. For all these we are responsible.

Later our environment is of our own making. How are these made? 1. By standards and thought. Newton was once asked how he made all of his discoveries. His answer was "By always *thinking* into them." In all ages we have had standards. The Greeks' standard was a physical one; the Romans' standard was intellectuality; the monastic standard was spiritual—a crucifying of the flesh: a crushing out of all things fleshly and supposedly earthly. Then followed the aesthetic standards, and then the athletic standards. Now the higher standard is ours—that of the all-around man and woman the fullness and completeness of the whole being. Nothing short of this must satisfy us.

Our standard of air is out-of-door air. We must have good air. Impure, foul air poisons us as we breathe our own breath; tuberculosis follows, and other diseases. We know we cannot heat foul air; we know a lighted match put in a bottle will go out if the cork is put in the bottle to stop out the air. That flame must have oxygen; so must we have oxygen to insure health and life. We breathe in oxgygen; we breathe out carbon dioxide, a poisonous gas, next in its deadly effects to *marsh gas*. The Hebrew fathers' injunction was "keep your windows open toward Jerusalem," meaning toward the East—the sunshine—so that our homes may be purified by these free and natural elements.

I say it is within the power and province of the home to know the human frame, to know what is best for making a perfect being of the babe—the child. "Knowledge is power" we are told—but only when we exercise that power that is knowledge. Who has the better right to know the child, the father and mother of the child, or the doctor? We all agree that the parents should understand the moral, the mental and the physical of their own child; then why have we commercialized this knowledge?

There are annually in America 650,000 deaths which are believed to be preventable. There are over 113,000 deaths due to infectious disease. Whose right is it to know how to stop this awful ravage of human life? American people are very sympathetic and responsive; they are liberal towards relief from floods and disasters, but we have only pennies and little thought for prevention.

Prevention in its multiple of forms is the underlying and upholding principle of the science of medicine; and all this prevention lies within the province of the home. It lies with us as individuals. We alone are accountable to God for our deeds. Doctors? Yes, always, for the materia medica, yes; nurses to aid, yes; but fathers and mothers to make us strong mentally, morally and physically. "Come let us reason together," with the knowledge that is attainable, is not sickness more or less a crime?

Consider one moment the hygiene of breathing deep, full breaths, inflating the spongy tissue with every inhalation; standing, sitting, walking, all with body erect, chest brown forward, and when sleeping, have a low pillow and give full expanse to the air cells in our bodies. Children are often considered stupid when there is a growth we know as "adenoids" which is clogging the natural air passages.

Parents should know when the condition exists, and not leave it for the now vitally interested teacher to discover after the child has remained at the foot of the class for a year or more. Our so-called *heathen* Hindu sisters can teach *us* mothers about the child's breathing. Her child, when very young, is taught to place its finger on the right nostril and breathe in a full breath, then quickly place finger on the left nostril and breathe out; then repeat, breathing in the left and out the right. This exercise is repeated several times a day and the head and nose kept clear and in perfect coordination.

The hygiene of bathing: The skin needs constant cleanliness; the pores left free and open that the impurities of the body may be thrown off. Hence two baths a week with warm or tepid water is none too much, and even every day is better if the occupation is a violent one. Then we need to keep the system accustomed to shocks; therefore the cold sponge bath; both done quickly each morning, the first thing on arising. Also the brisk, sharp rubbing with a course rough towel. Putting one's skin in a healthy glow is one sure measure to avoid colds. Get into clothes quickly and drink a glass or two of pure cold water, and our bodies will be in condition for a good, hard day's work.

Hygiene of our clothing is next to be considered: *Clean clothes* at least twice a week, because as the body throws off poisons and disease, our clothes absorb these, and our clothes must be recleaned to be able to take up these impurities.

Hygiene of the teeth: These are given us for masticating our food and they deserve only our best care. Careful brushing every night before retiring, and in the morning before eating; tooth powder or ribbon paste used once a day. The toothbrush should be carefully protected from dust and dirt when not in use. We cannot be too careful of the children's teeth. Remember the health of the child depends much upon his teeth..

Hygiene of the hands: There is no excuse for us to eat with dirty hands. Our nails may not be polished as though we just came from a manicure shop, but good hot water and soap with a handbrush, is easily used, and necessary to the health of the whole family. Our hands should be clean when we go to bed.

Hygiene of the feet: How many of us have suffered with sore feet? Partially because we do not take proper care of these pedal extremities; partly because our parents were not careful about adjusting our stockings and our shoes after we were supposed to care for ourselves. Mothers are bound to the custom in caring for feet of infants, but how about the feet of those children after three years of age?

One cardinal principle of every house should be *order*. It is heaven's first law—a good one to put in our heavens here below. This will embrace cleanliness—a good habit. What is habit? "It is ability to do with a minimum of attention." It is a saving of energy The habit of cleanliness is a good one. Keep in mind, however, there is a difference between dirt and clutter. The first one we will not tolerate, and the second we must not keep in our homes. Cleanliness is next to godliness; yea, further, without cleanliness we cannot have godliness.

The second cardinal principle is out-of-door air; its composition is nitrogen and oxygen, principally. Nitrogen—there is a German proverb, which, translated, says, "Without nitrogen there is no life," and we know that oxygen is necessary for the maintenance of that life. It is said the body needs five hundred cubic inches of air per minute; this makes three thousand cubic inches of air per hour. When wo do not have out-of-door changing this air constantly, are we getting our quota of the life-giving substance? Out-of-door air and sunshine make healthy human beings.

Herbert Spencer says, "one of the first requisites for success in life is to be a good animal;" and to be a good animal is the basis of national prosperity. There can be no right thinking without a sound body, and there can be no sound body without a sound mind, and no sound mind where there is an unhealthy dis-co-ordination of the parts which make life. Sound is used in the sense of incomplete. Why have we brains if we do not use them?

There is the hygiene of the eyes: Care of towel, using only one's own towel, will lessen much eye trouble in our families.

Hygiene of the ears: One advice I quote, given by an old physician: "Never pick the ears with anything sharper than the point of the elbow."

Hygiene of our food: This leads us to sanitation and bacteriolgy,—yeasts, molds and bacteria. Time and space are too limited to discuss this subject at length.

Our drinking water, another source for watchfulness. "Eternal vigilance is the only price of safety." Use only individual drinking cups. If you happen to be without one, and need one, let me show you how to fold a piece of paper so as to make one that will answer all practical purposes. The common drinking cup is a source of danger. Never use it under any conditions.

With all, let us keep sweet tempered and in good cheer.

Cheerfulness is nine-tenths of practical wisdom. And then do not forget to smile:

"The thing that goes the farthest towards making life worth while,
That costs the least and does the most, is just a pleasant smile:

The smile that bubbles from the heart that loves its fellow man,
Will drive away the cloud of gloom and coax the sun again.

It's full of worth and goodness too, with manly kindness blent;
It's worth a million dollars and it doesn't cost a cent."

Then we must have sex hygiene: Here is where the home has failed utterly in its value. The home, our greatest educational institution, is fast losing the opportunities, because we home-makers do not know what is our privilege to know—what is our solemn duty to know; and then we must have the willingness to teach our boys and girls the sacredness of the human body.

I appeal for an intelligent reading by every home-maker—by every *to be* home-maker, every father and every mother. I will mention only a few of the many good books that all of us should read: Jane Addams' book, as it appeared in McClure's Magazine, beginning November, 1911; an article by the Bishop of London, as in the Ladies' Home Journal, for May, 1908; Anna Galbriath's "Four Epochs in a Woman's Life; G. Stanley Hall's "Social Problems." All are good beginnings, and will lead you, I am sure, to more advanced reading on this important subject.

Knowledge, let me repeat, does not make virtue or morality unless we make it a part and parcel of our daily living.

While conservation is in the air, let us get into line and conserve our homes and the human beings composing those homes. Conservation is the progressive thought of the hour, so let us be prudent, wise people and work for increased efficiency and prevention of waste of life. Do you know, life insurance statistics proved that every ninth man who applies for insurance is rejected? Just by our not exercising our brains, our knowledge. See the waste!

The material waste in every American home is appalling but that is another subject; and the waste of humanity is more heart-rending.

"Let us be up and doing while it is yet called day."

MR. HOLMAN: I would like to ask the lady a question: Do you ever say anything about window curtains, and flowers on the window sills? I think you would get more fresh air if these things were kept out of the way.

MISS BURNITE: Oh, you must throw the curtain back, and put your flowers in a window with a southern exposure, so as to have them "open toward Jerusalem." This way it will still be possible to have the fresh air.

MR. HOLMAN: Can't we get rid of them altogether, if they go out of style?

MISS BURNITE: Yes; or by changing the style.

MRS. FOULKE: It is very gratifying to me to know that the sort of people Miss Burnite speaks of is not entirely due to mothers' training; other forces enter into their lives, and it is just as well to let some one else take the blame.

We will deviate a little from the regular program for a few minutes, to let Mrs. Ott speak to us. I do not know who she is, or where she comes from, but Mr. Martin wishes her to speak to us. I don't know what she will talk about, but she will now address us.

Mrs. Ott spoke as follows:

ADDRESS BY MRS. CHARLES OTT, Sayre, Pa.

Your President says I will speak to you for a few minutes, so I will not take up much of your time, and I am not going to talk to you about farming, because I know nothing about it. I may learn, though; I hope to buy a farm soon. I am going to talk to you about a woman's education for the women of the farm. It should be a business education, because the woman of the American farm is a business farmer.

It has been said that what the Americans waste and consume amounts to ten million dollars a year, and the spender of this money is the American woman. Now, there you have your problem; where is the normal woman going to get her education from so as to spend this money intelligently? When our good forefathers decided we were to be a democratic people, they decided the women did not know enough to help rule this democracy, and that it would be better for our own good, and for the good of the men who were going to rule the nation, if we were to have a little more education. Still, there was only one kind of education to give the women, and that was the man's education for a man's work, so all along they have given this woman a man's education. What was the result? Once the door was left open ever so little, this woman pushed it open a little farther and crowded her away into the arts, and some of them into the professions; and, having seen something of the work outside of the home, can you blame these women, after they have had a peep at what is going on in the world, for wanting to go on farther still? But year after year, when a woman went to college and studied chemistry, it was claimed she was figuring to do a man's work. So until within the last thirty years, while she did know silk and fabrics, she didn't know very much medicine, or science. Then it was seen that this woman would take up these studies and apply them, with the result that there has been a one-sided development. Now the time for the reaction has come, and our colleges are beginning to see that if these sciences are taken up and applied to the daily life in the home, there will be just as thorough a mental development, and when this is done, and only then, will you have an all around education for women.

The West has done this, and at the same time kept to the applied sciences as the East has. A few years ago I had occasion to place a young girl in a college, and when I asked the principal if they had a course in Home Economics, she was rather horrified and said "No, Madam; our students come here for higher education." But the change in sentiment is coming. I was perfectly delighted a few weeks ago in talking with one of the professors in one of our larger colleges, and, by the way, he was a Professor of History, to find that they are beginning to give serious thought to it in our larger colleges. They are beginning to realize that it is the education that fits men and women for practical everyday life that counts even more than the applied sciences.

The necessity of getting this form of education for women into our public schools early as possible will have to be realized. Instead of putting it in the higher grades as a part of the finishing course, it will have to be taken up in the lower grades, if it is to reach the very ones who need it most. It will not effect your people of the farms much; your modes of life are fixed; but you can do this; you can bring it before your school boards, and you can stand for what it stands for. It will give a chance to your boy and your girl—for the boys will be given a chance in this new form of education. Too many of our boys and girls have to leave school before reaching the higher grades, to leave this course there. Put it where they can have the benefit of it. Put your energy into it, and your personality into it.

I am interested in Home Economics for the entire State of Pennsylvania. The State Farm car goes over these broad fields from time to time, and tells the men what to do for the bugs and the parasites, when you must plant, and what, and how, and how much to feed your cows and hogs, and of balanced rations for your stock, and how to proceed to get the best results out of your soil, but I never see a thing about how the farmers' wife should milk, or a single word about the best balanced rations for her boys and girls; never a word about how she can prevent germs and bugs from getting into her house. These things are considered important enough for the Chicago University to send out bulletins on for the benefit of the farmers' wife, so why cannot the State of Pennsylvania take up this subject and give some thought to the farmers' wife and her problems, as well as the the problems of the farmer and his soil and stock? I don't see why there cannot be set aside in this farm car one little corner equipped with the latest labor-saving appliances for the farmers' wife, with some one to tell her how to use them and speak to her of her individual problems, just the same as the men. Give here a course in Home Economics. A woman in one end of the car will take up but little room, and the results will be far-reaching.

I thank you for the privilege of speaking to you this evening.

MRS. FOULKE: I don't altogether agree with Mrs. Ott about that corner of the car. I think the women are being driven into a corner too much as it is; what we want is a whole car attached to that farm train, with a woman lecturer to talk on the subjects that are vital to the farm woman, and I see no reason why this could not be done. The additional expense would be very little, and the good resulting from it would be tremendous.

I am now going to introduce a woman who has been very active in the Rural Progress Association, of which I am a very small member, while she is a high marker; she is the President of the Association. She is going to speak on Rural Progress, and I predict that like Mrs. Ott,, she will have something to say, and will go right home with it. Mrs. Smith will now address us.

Mrs. Smith spoke as follows:

RURAL UPLIFT

By MRS. E. E. SMITH, Pennsdale, Pa.

On March 14th, 15th, 16th, a Country Life Conference was held at Philadelphia. Much of interest and profit to agriculture and farm life was brought out at that conference. The whole question of rural progress was gone into in all its phases. Business conditions in rural districts were talked of, the school, the home, the roads, the church, were all touched upon.

But perhaps the greatest emphasis was laid upon the school as forming the backbone of the rural problem. Farmers have long wondered why it is that the boys and girls have left the farm in such numbers, but it is beginning to be recognized that the sort of education given, points to the city, and not to the farm. A country school might be described as a weak imitation of a city school. The records of our schools show that a strictly classical course, such as the schools have given, leads to city life, and to more or less clerical occupations. The fathers tell sons on the farm "there is no money in farming," and every year the son hears nothing but knocking, as regards the father's business. The average farmer is a knocker, not a booster, as the common expression goes. It is the city men who recognize in agriculture a profitable business and send their sons by thousands to the Agricultural Colleges, while the farmers are giving their sons a training which fits them for nothing, or fits them to be typewriters and clerks. The only form of education for the rural districts is the agricultural graded and high schools—a school which puts agriculture within walking or riding distance of every boy on every farm—a school which though teaching all the standard branches, gives the boys an outlook toward husbandry, which turns their thoughts early to the wonder and charm of farm life and the sciences which underlie it.

But the farmers say these schools cost too much. Yes, they are not cheap. Cheap and nasty go together, you know. The man who is fitted to be the principal of an Agricultural High School will get a salary of not less than $100 a month. That does not sound much like the paltry $40 a month which you are paying the rural teacher in the one-room rural school. But what does this man do? Well my friends, he will be the best investment you ever made. He will teach your boys, and he will teach you. He will save you hundreds of dollars in teaching your boys how to really practice agriculture. Your boys will raise, under his teaching, 40 bushels of wheat to the acre, and other crops likewise. Your boys won't buy potato fertilizer and wheat fertilizer on the fertilizer company's recommendation, as you have done. They will buy the stuff of which the fertilizers are made, and they will know just what to give your land to raise a given crop. Your boys won't breed Jerseys and Holsteins and God knows what in order to get an original strain of your own concoction. They will breed pure bred animals and follow the laws of science. Your boys will understand drainage questions, and they will recognize a need of drainage when they see it.

Most people are agreed that we should have better country schools. This is shown in one way by the movement of the country people from the farms to the cities to secure better school facilities. In Illinois there are 50,000 fewer people in forty-six of the richest agricultural counties on the farms now than there were ten years ago. To secure better schools some urge that more money should be expended for better buildings and equipment and for trained teachers to give better instruction. This means higher taxes; but the advocates of this claim that increased values of land and products raised on the farms make it easier for the farmer to support his school. Others claim that the home should co-operate more closely with the teachers. This means some time and energy on the part of the parents. Others urge that the school officers take a greater interest in the school. This means also the sacrifice of some time on the part of the busy farmer. Others go to the people themselves and claim that the people should take more interest in the annual school elections. This means that the tax-payer would give two or three hours each year to attend his school election. As it is, the average school election is a farce and men are often elected to the position of director as a joke. And yet, if it were seriously proposed to abolish the office of school director in the several townships and put in a county board to manage the schools in a business-like way, the greatest howl and opposition would come from those school directors who take no interest whatever in the schools.

No one can get something for nothing. If we are to have better schools, the first thing necessary is to spend more money in a better way, to secure a better school organization; to secure better buildings, with equipment; and to secure State Normal trained teachers who will prove an inspiration to children and a live force in the community life. But teachers cannot spend money to secure training for greater efficiency to render better service, on the low salaries now paid by the farmers. Some school districts began to levy annually two mills thirty years ago, and they haven't changed much since. Nearly all townships are levying a shamefully low amount in proportion to their assessed valuation. It is the commonest thing in Pennsylvania for townships to call for a five mill assessment when they are permitted to call a twenty-five mill assessment for school purposes. Is this your township? Are you paying your school teachers at the rate of $300 per annum when even the day laborers of Philadelphia get $580?

Evidently something must be wrong with country life. The farmer finds country life satisfactory only on the financial side, and not even on that side, in some sections. The best factor in developing country life civilization is the human factor, the man or the woman. Men and women with a wider outlook on life may be developed from the boys and girls now in the country schools. More and better sanitary regulations in the school-room, as well as outside, doing away with the unsanitary, crime-breeding outhouses or privy, will make the physical conditions necessary to produce healthy men and women. Hence great need for more heating and ventilating systems, plenty of pure, fresh water, proper light for study, and abundant opportunity for good, wholesome play during recess and at noon. The average township has ample financial power to make a good sanitary, comfortable building for the children, where 95% of them get their only education, so far as books are concerned. Better physical conditions for school room work are absolutely fundamental in making a better school. A well-equipped building, sanitary in all its appointments, with a well-trained teacher in charge, all located in the country, makes an educational institution hard to beat. This the farmers of this, or any other locality can have, if they will pay the price. There is no other way.

Along with the physical needs are the mental and spiritual needs of the child. So the movement for better pictures on the wall, better color schemes for interior furnishings; in short, school room decoration must go along with school sanitation. Also, the library movement must be encouraged if the next generation of men and women are to be thinking men and women.

But perhaps the greatest value of all to the country child is the teaching of agriculture and home economics in the rural High School. The following is a partial list of what such a school may teach: Nature study, how to know trees, birds, flowers. How pitiful is the ignorance of country children about such things. How many country children know the names of even the commonest flowers, calling Arbutus "May flowers;" and also I have known daffodils and narcissus to go by this name. The school gardens teach the children the habits and needs of plants, as well as tillage and preparation of the soil.

Farm crops: Corn seed selection, clover seed testing; how to know a weed seed from a good seed; the different kinds of cultivation needed for different crops; observation of the root growth of different plants, their fertilizer needs, etc.

Nitrogen gathering crops, such as alfalfa, clover, vetch and soy beans, are studied. Experiments with, and without lime, phosphoric acid, potash and nitrogen, are run; the handling and care of manure; animal husbandry and the theory of silos and ensilage, both for dairy and beef cattle; and besides these things, the chemistry, physics and botany which underlie them all.

Finally, the Agricultural High School provides that most sorely needed thing in every rural district, a social centre where the community may gather together and be instructed and amused. This centre should be the common meeting ground of the Farmers' Club, the Grange, the school, the church, which are all organizations for the betterment of rural life. This centre should be the clubhouse for the farmers' family. It should be the amusement centre for the young people. Here should be the centralized school—a real country school with no less than ten grades. Can a purely rural people afford such ideal, such real education? Better ask can they afford to permit their hungry acres to be half tilled while the city swallows up their young. The boys and girls who are to shape the rural life of tomorrow are in the rural schools today, and will go directly from the school to their life work. So long as these children have poorer school facilities than are given to the children of the town, and so long as the education they receive disregards their past experience and their probable future occupation, so long, indeed, as stress is laid in the school room and in the home, upon the advantages of city life, without teaching them how they can attain to a better life on the farm, the drift toward the city will continue unabated, and the complaint of too few people, and poorly trained people will ever be heard in the rural districts.

MRS. FOULKE: I want to keep you just one moment before I introduce the next speaker. I want to make a suggestion. I learned something from the way the men conduct their meetings. When you want something, you make a suggestion, and not a resolution, so I make a suggestion, and I want you to think it over. I think you should put a woman on the Board of Agriculture.

MR. HOLMAN: I have enjoyed these speeches very much, but I think we are making more progress in the country than these ladies give us credit for. At least the women down our way are. The lady who cooks for me is following Mrs. Scott's recipes, and the other morning she cooked a breakfast for us for four cents. At that rate, we will soon be getting our breakfasts for nothing.

MRS. FOULKE: We will now have the pleasure of listening to Dr. Russell, who will speak to us on "Hygiene and Sanitation in the Public Schools." It gives me pleasure to introduce Dr. Russell.

Dr. Russell spoke as follows:

SANITATION AND HYGIENE IN THE PUBLIC SCHOOLS

By DR. A. L. RUSSELL, Midway, Pa.

I want to emphasize what these ladies have said; they have said what I would not dare to say, what no man would dare say, and yet what is true as gospel. I don't know what your politics are, and I don't care, but I dare not say one word about the way our public schools are conducted today without some one jumps up right away. These ladies have told you a part of the thing, and I am going to tell you some more, although they have left but little for me to say.

Our public schools are the citadels of our nation, but they are not all they should be—to our shame be it said, but it took these noble, pure women to tell you so. If you want to know what the condition in our public schools are today, ask your doctor. He could tell you, but dare not. His lips are sealed. I know it now, but I did not know it twenty years ago; these women know it today, but they did not know it twenty years ago; it is a matter of sex. I could give you instances from my own experience, which I would not dare give you, and I know it is the same in your own section, and in your own town; it is the same in Bradford county as it is anywhere else. But don't ask your preacher; ask your doctor, even though he will tell you what will make your hair grayer than it is now. Doctors have known it for years, but they didn't dare come and tell you, and now you leave it to the women to tell you. I am ashamed of myself.

One of the speakers told us about the girl who drank from the cup from which her fiance' had just drank, when he was ill with tuberculosis, and of the bravado with which she did it, and how she died of it. Now, ladies and gentlemen, the next time you have occasion to use a common drinking cup, wash it out thoroughly, and then drink in this way, without letting the cup touch your lip.

The SECRETARY: I suppose the ability to do that depends somewhat on the length of your lip.

DR. RUSSELL: I'm Irish; are you? I would like for every one in this audience to remember this the next time they have occasion to use a common drinking cup. It is very easy to do.

Now there is another matter, a very important matter, and that is the matter of breathing. There are two types of breathing, the male and the female type, and the nearer the female approaches the abdominal or male type of breathing, the better it will be for her. But it is not right to breathe first through one nostril, and then through the other, as the lady has shown us the foreign people do. That may be all right for foreigners, but it is not for Americans. You want to breathe deeply through both nostrils; breathing properly this way for any material length of time will increase the chest or bust at least four inches.

One of the ladies spoke about the cost of education. I think the people of Pennsylvania have reached the point where they do not care about the cost of education, so long as they get the proper kind of education. It is the right kind of education that we want, but we have not been getting the right kind of education. Remember that I have all due respect for the authorities in charge of this work; they have not been able to do the work as it should have been done, and with all our short-comings, there is not a state in the Union that has the excellent public school system that we have in Pennsylvania.

Observations made during seventeen years' service as a priest of the suffering, has convinced me that the whole field of hygiene and sanitation, in its relation to the physical, mental and moral nature of the child during its school life, is deserving of a consideration at the hands of parents and educators which it has never yet received. It is amazing when we consider the efforts put forth to equip children with the mental powers which will enable them to wrest a livelihood from the world, that it has never seemed to occur to any one that the child might need to be taught how to live. The teacher can not impart this information, for she has never, herself, been taught, and the rigid county or state curriculum leaves no time for such a minor detail as instruction in the methods of right living. The parents cannot give the instruction, for they have not the knowledge. The pastor cannot fill the need, for *he* knows less about how man should live his physical life than does the average person. The doctor could, of course, for his life's training and experience has fitted him for this sacred duty; but, bless you, are not doctors to make people well *after* they become ill? And so, although the whole world is calling for the physically fit, our children are permitted to acquire their bodily development just as chickens and horses do, and any information of value in teaching them how to live must be self-acquired, and then it is everlastingly too late to be of any practical value to them.

The rational aim of education should be the correct and symmetrical development of the physical, mental and moral nature of the child; and that system of tutelage is deficient which neglects any one of those three attributes of all normal human beings. The relationship between these three is too intimate and too intricate to be dissolved, or to be interfered with by any man-made scheme, and a proper development of each is possible only when the development of one is made to assist and accelerate the development of the others. The desirable goal is a sound mind in a sound body; for a brilliant mind in a deficient body is a sorry spectacle, and a feeble mind in a perfect body is pitiful to contemplate, while a depraved moral sense coupled with a keen mind and a vigorous body makes devils laugh and angels weep.

Because our common school system ignores these facts, it is failing to give the child the advantages to which he is entitled. The State has assumed the responsibility of the care of our children during their school days, and parents have conceded to it that right. Yet it has provided no adequate means for discharging that trust. For who is so utterly ignorant and thoughtless as to claim that the child's future is wisely provided for when only his mental training is comprehended? Our common school of modern times, in its curriculum, customs, discipline and deportment, has been fashioned in ignorance of, and in defiance of the simplest elementary rules of hygiene and sanitation, and it is small wonder that the normal balance established by nature has been disturbed. It is of vastly more importance to the school child that his triune characteristics by symmetrically developed, than it is that he shall excel in any text-book. It is of vastly more importance to him that he be taught to breathe properly, that he know how to insure for himself an adequate supply of fresh air and pure water, that he appreciates the importance of masticating his food properly, that he learns how to work, and how to sleep, and how to clothe himself hygienically, that he be made competent to guard himself from infections and contagion, than it is for him to be able to bound Patagonia correctly, or to trace the course of Mason's and Dixon's line.

"The building of a perfect body crowned by a perfect brain, is at once the greatest earthly problem and the grandest hope of the race." The morality of clean blood ought to be one of the first lessons, and by every consideration, the very last and most emphatic lesson ever taught in any public school anywhere on earth. The preservation of health is a moral and religious duty. "Life is not merely to live, but to live well."

Not only are the fundamental principles of correct living ignored in our schoolrooms, but every day, in every schoolroom in this land, the commonest mandates of hygiene are audaciously violated, and bodily infirmity, physical deformity, and mental deficiency are recklessly encouraged. The vital force which should be utilized in the production of blood, muscle and nerve, is lavishly expended upon illy advised studies. There is something radically wrong with the mode of conduct of our schools in their actual working upon the health and physique of our children. We send our children to school happy, healthy, blooming and lusty; and the monster hands them back to us with adenoids, incurable catarrh, round shoulders, crumpled chests, distorted spinal columns, sallow cheeks, deficient vision and shattered nervous organizations. Such maladies, and many others, are thrust upon children all over this broad continent by the customs, mode of conduct and environment of our common and high school systems. I have never seen a schoolroom, city or country which was not in some way a positive menace to the health of the children forced to occupy it. And the universal errors of construction are intensified and augmented by the method of discipline, habits of study and mode of recitation now in vogue.

I am not arranging the teachers; I am not accusing the school boards; it is you, the patron, who is guilty of these crimes against your own defenseless children. Your teachers and your school boards remain in this benighted ignorance because *you* have never demanded knowledge or competency when you selected them.

The common country school should be a kindergarten for the farm, and from it the farmer population should be recruited and come forth educated into, and imbued with, the high and noble ideals this nation now so much needs. The country school is of the farmer, for the farmer, and by the farmer, and the farmer cannot shun the responsibility for the condition of things as they are. The curriculum of the common school should lead the child toward a life on the farm, and should fit him for being a good farmer. We want more competent farmers; we have too many poor ones. We have too many mediocre preachers; too many incompetent doctors; too many shyster lawyers; too many alleged business men who have not the mental capacity to run a well-regulated peanut stand. What are your farmers' schools doing for the future generations of farmers? Nothing! The moment the child enters the schoolroom he is educated *away* from all desires or tendencies toward a farm life. Not a single thing does he learn during his whole common school course which will instill a love of the farm into his withering soul, or which can help him if he is forced to take up that occupation. And when he enters high school it is still worse. Don't shake your head at me that way! Don't say you can't help it! You *can* help it! You don't want your boys to be farmers! You want them to be pastry-faced counter-jumpers at $15 a week--you are training them for it in your public schools. You *can* help it, I say! The farmer pays the taxes which support the common schools in the country; he elects the school board, which selects the teachers. It is all in your own hands, if you care to assume the responsibility.

Our school system of to-day is so diametrically opposed to common sense that it is difficult to suggest a starting point for reform in study, but I might call attention to the most useless branch of all—physiology. What we have, however, is only *alleged* physiology, for it was prepared and concocted, and it is taught, by those who have no physiological knowledge, so that its teachings are of no practical value to anybody. The average human being will be no better because he knows how many bones there are in his body, nor because he knows how many ounces of blood his body contains. What he needs most to know in this line is what to do when he breaks a bone, and how to check the flow of his life's blood when he cuts an artery. The children need to know how to marshal and conserve their physical and spiritual forces so that they may go out into the world and play the part of whole and healthy men and women.

Generations of educators, utterly failing to grasp the import and purpose of the science of physiology, have attempted to mold one of the most difficult branches of the study of medicine into a form suitable to the immature minds of children in the public schools. Naturally the result is a failure. No one who had himself any conception of physiology would ever have made the attempt. After over twenty-five years of teaching of alleged physiology in the public schools, the simplest sanitary truths and principles are unknown or unheeded by the most intelligent members of the community. The lingo taught in the public schools, dignified by the term physiology, was conceived regardless of the child's environment, nature, body, or immortal soul. It does not teach him how to live, and it certainly does not teach him how to die. This outrage is perpetrated and perpetuated in cheerless, barn-like structures, without provision for any adequate supply of fresh air; without the facilities of getting even a clean, decent, drink of water; with arrangements for lighting which seen devised to place the greatest possible strain on the eyes, with heating arrangements which vitiate the air, with unsanitary surroundings, and with no proper adjustment between mental processes and physical activity.

We must conform our teaching of physiology to more rational standards, if we hope to benefit the human race. "The knowledge that a man can use, is the only real knowledge; the only knowledge that has life and growth in it and converts itself into practical power. The rest hangs like dust about the brain, or dries like the rain-drops off the stones." (Froude). Our children need no anatomy and no physiology except what is necessary to enable them to apply the rules of health to their modes of life; all physiological education in excess of this is *junk*. And, strictly speaking, such knowledge is not physiology at all—it is sanitation and hygiene.

Therefore we insist that the so-called physiological education of the common school pupil should be limited to those practical matters which enable him to ward off pain, prevent sickness, promote physical efficiency and postpone death. No workman is fit for any task unless he is first of all fit in body and mind; and school conditions, as now existing, for six hours a day, for nine months in the year, for ten years of our life, do powerfully and injuriously affect both the mind and the body. This powerful influence should be made to work for good instead of evil. It is working for evil at the present time, and no man with a knowledge of the facts dare deny it.

So that, instead of teaching physiology, which is the science of the organs of the body and of their functions, I would teach hygiene and sanitation, which is the science of health and right living. In place of spending time and energy in teaching a child how its teeth were formed, or how its hair grew, or how its skin was constructed, I would have him learn how to take care of and how to preserve his teeth; how to care for, and how to make his hair luxuriant and beautiful, and how to keep his skin clear, active, and free from disease. I would teach him how to know what ventilation is, and how to secure it. I would teach him the ineffable dangers and filth of the common drinking cup, and how it distributes germs from the ailing to the well. I would teach him the nature of typhoid fever, and have him know that every case of typhoid fever is a *crime*, which he can aid in preventing when he knows how the contagion is transmitted and disseminated. I would have him learn the dangers of the common house fly, and its capacity for spreading disease. I would inform him upon the principles of stratification of soil, and the proper modes of drainage. I would teach him of the germs which go to make up the infection of simple wounds, and how they produce lockjaw (tetanus) and blood poison (septicaemia), and how they should be dressed and cared for to avert these calamities. I would tell them of the nature of scarlet fever, diphtheria, (acute anterior poliomyelitis) infantile paralysis, measles, whooping cough, and how those diseases are carried from the sick to the well. I would give them an idea of the rules of disinfection and quarantine, and how to carry them out to cut short an epidemic. I would teach them the nature of tuberculosis, and how it is transmitted and disseminated, and how the great principle of the use of fresh air is baffling the "great white plague." They should be impressed with the fact that if fresh air is so good for the consumptive and cures him, that fresh air is good for him who has not contracted consumption, and will prevent him from taking it. They should learn how thorough vaccination prevents smallpox, and be taught enough of the statistics of this fact to be able to discuss the matter intelligently with the rabid and fanatical antivaccinationists. I would teach them that absolute cleanliness of body and soul encouraged longevity and made for happiness. I would make good health contagious, instead of disease. This would not be physiology, but it would be a knowledge that would be of practical service to every child every day of its life.

Theologians tell us that "Sin is any want of conformity or transgression of the law of God." But there are sins and sins. There are sins of the body as well as sins of the soul, and both involve inevitable retribution—sins of the soul in the life to come, sins of the body in the present life. There is such a thing as physical morality, just as surely as there is such a thing as spiritual morality. We teach our children how to conduct their lives in accordance with the precepts of spiritual morality, so that they may not be gross sinners against God, but we ignore the existence of physical morality, and permit our offsprings to become the most heinous of physical sinners.

Just so surely as a moral sin is a crime against God, so is a physical sin a crime against man, and because that physical sin is often committed against our own bodies, it is none the less atrocious. Our God is a God of Nature, and our physical sins are quite as certain to demand retribution in the body as are the spiritual sins to demand retribution in the spirit. Every instance where a preventable disease is found to exist is an instance of the commission of a physical sin.

We can enforce public hygiene by law, if necessary, even at the bayonet's point, but personal and domestic hygiene must be taught, for it can never be enforced by law. And general sanitary improvement in the lives of our citizens, or in the conduct of the home of the nation, must take its origin in an enlightened and public intelligence. There is no other way to formulate an enlightened public intelligence, except by creating a hygienic conscience in the young and growing souls of our children, and this can only be accomplished by appropriate instruction in the public schools.

Patrons, superintendents and school boards are evading the moral responsibility for this physical sin, for it *is* a physical sin to permit the child to grow up ignorant of the methods by which he may take the proper care of his body, and likewise ignorant of the manner of life which tends toward physical rectitude. Conscience is almost wholly a matter of education, and we could develop a physical and sanitary conscience in our children with equal facility, as we develop a moral and spiritual conscience within them.

THE APPLICATION OF THE PRINCIPLES OF HYGIENE

The earliest copy-book, whose admonitory lines our cramped fingers laboriously followed in our primary school days as we kept time with wagging head, should have given us an inkling of prophylaxis. When a doctor says "prophylaxis," he means the warding off of the disease. These copy-books told us that "A stitch in time saves nine," and, "An ounce of prevention is worth a pound of cure." Our teachers never appreciated the golden truths locked in those few words; oh, no! they were teaching us how to write. We children might have got something of real value out of that lesson if our teachers had realized that they had in their charge developing minds and immortal souls, and if they had been competent to discharge the duties of their trust. A few chosen words of instruction and counsel regarding the meaning of those phrases would not, probably, have unduly strained the mental powers of those teachers, but the words were not forthcoming; they were *teaching us how to write.*

An ounce of prevention is worth tons of cure! The quiet, modest physician who prevents the development of disease, is greater than the most skillful and famous physicians the world has ever known. The man who wards off an infection from an innocent, healthy child, is richly deserving of the Hosannas, not only of men, but of angels.

The greatest and most noble victories this world has ever known are not those of the battlefield, with its glory, its thrilling bugles, and its waving flags. No! The sublimest victories ever won by men have been those of sanitation and hygiene, or in other words, prophylaxis; that is, prevention in place of cure. Pasteur will be immortal because he changed an art to a science; The name of Koch will never die because he taught us the baleful power of germs; Reed goes high in the glory line because he swept Cuba free from Yellow Fever; Jenner banished the plague of smallpox from all those who wished to be free; Gorgas changed the reeking quagmire of Panama to a sanitary land of wealth and beauty; Behring has saved his tens of thousands from the horrors of death by diphtheria; Stiles is even now driving out the hook-worm from the Southland; and it was all done by the men who realized and accepted the plain laws of hygiene and sanitation. If you will put teachers in your schools who know the laws of sanitation and hygiene, you can banish parasitic diseases from the earth within a dozen years.

FRESH AIR

Children in school, in common with all mankind, consume three kinds of food: air, water and solid food. Air is the cheapest, the most abundant, the easiest secured, the most important, and the most neglected. We can live without solid food for three weeks, without water for one week, and without air for three minutes. Most of us are rather fastidious about our solid food, and the national government has a Pure Food Bureau maintained under the auspices of the Department of Agriculture, with a cabinet official at its head to guard our interests. But there is no bureau or law to prevent us from bathing in or from drinking the water that has passed over or through the body of another, though most of us would be very loath to use such water if we knew it. However, we seem to have no scruples about breathing the sewage from other persons' lungs and throats, even if we know that they cannot all be healthy. In the winter time we conduct ourselves, our houses, school-houses and churches, as if their purpose was to contain air to keep us warm. It is astounding that humanity has never learned what air is for, but they have not. Air is to breathe, not to wear; it is food, not clothing. You should depend on your garments to keep your body warm. The first consideration is to have the air you breathe as pure as possible for warmth at the price of vitiated air is wicked and vicious.

Most people think it is the oxygen in the air that our bodies most imperatively need. In a certain minor sense this is true, but any old kind of air contains oxygen enough to support life, even that air which has been breathed over and over again. It is the carbon di-oxide in the air which poisons us. When air enters our lungs, it contains but four parts of carbon di-oxide in ten thousand, but when it leaves our lungs it contains 430 parts of carbon di-oxide in 10,000 parts, or more than four hundred times as much poison. The problem of ventilation is not to get air into a room, but to get the carbon dioxide out. Very little excess of carbon dioxide in a room will induce drowsiness, mental dullness, and slight headache. Long continued exposure to such conditions induces pallor, systemic weakness and general ill health. In order that each pupil have enough fresh air to breathe, it is necessary for him to have 3000 cubic feet of fresh air every hour.

space, and the air must be changed five times every hour. To secure this amount of fresh air, he must have 600 cubic feet of air space, and the air must be changed five times every hour. It is a mistake to think that the apparatus must be expensive or elaborate in order that the ventilation be adequate. If you will give me a few elbows of four-inch stove pipe, and tools for making openings through the walls, I can install a perfect system of ventilation in any room at the cost of a few cents. There is no mystery about air currents. Any one who knows anything about hygiene and sanitation can explain them to any school board in a few minutes. Heated air rises; carbon di-oxide is heavier than air, and falls to the floor. Hence make openings for fresh air to get in; heat and moisten the air; make openings for the carbon di-oxide to get out, and provide for circulation, and you have a perfect system of ventilation.

Many townships in the State have a perfect (?) system of ventilation. They know it, because the agent who sold it said it was. The fact of the matter is that the schoolroom has no ventilation at all. The furnace has all the fresh air it needs, and the carbon dioxide the furnace creates has an outlet, and there is a perfect circulation of air about that furnace, but the schoolroom is not ventilated, for there is no provision for air currents. The air the children breathe is vitiated, and loaded with carbon dioxide, for there is no fresh air reaches the part of the room where the children stay. I can bear witness, however, that the furnace is perfectly ventilated; it has all the fresh air it needs, and its carbon dioxide is taken away.

These conditions are not likely to last always? Pennsylvania has already provided, in her new school code, for ample air space for every pupil in all schoolrooms which shall be constructed in the future; she has provided for proper methods of lighting; provisions are made for sanitary surroundings. But, let me call your attention to the fact that this is merely law. It is of absolutely no account unless it is enforced, and it will be your duty, as patrons, to see that its provisions are executed. School Boards will obey it, you say. Will they? They violated the laws of God and Nature before; perhaps they may remain unterrified before this statute.

We will soon try the experiment of compulsory medical examination of children in the public schools. If you, as patrons, support this measure, many of these abuses will be nullified and abolished, and our disgrace in this line will disappear and be forgotten, except where it is manifested in the crippled victims who will live as relics of the barbarism gone before.

But the attempt has not yet been universally made, and if the people resist it as they resisted the attempted compulsory vaccination a few years ago, and the State is as week-kneed as it was then, we will slide back again into our former condition of apathy.

Our new school code is a great stride forward, and it will doubtless do much good, if the people support it. But there are glaring errors in it, which, we will hope, will be remedied by future legislatures. No legal enactment can absolve the parent from his duty, and no law can remove the responsibility from your shoulders. You cannot put a sanitary conscience in a man by law. What do you know about the course of study, or the methods of recitation, in the school your child attends? What about the actual sanitary condition of the room and its surroundings? You know what the conditions and studies were when you went to school. Do you realize how greatly conditions have been changed? Where is the emphasis laid? Does your experience tell you that your child will be better fitted for life than you were? Is the school better today than it was twenty-five years ago? It ought to be. Yes! But is it?

Who is responsible for the curriculum? You can see the problems which will confront your boy in the future, to some extent. Is he being equipped bodily and mentally to meet them? If not, what are you going to do about it?

Every one of you knows in your heart that the horrible conditions I have detailed are true. They are common talk. What are you going to do about it?

One of the most vicious customs of construction of school buildings is applied to the position of the windows. Almost universally we see the country schoolhouse with a row of windows in each side, with the desks ranged between. Quite commonly the blackboard is in front, or between the windows. Wherever it is placed, great care is taken that the light from two windows will fall upon it, so that the pupils' eyes will be continually subjected to the greatest possible strain. If you have never thought of this, try placing a clock directly, and endeavor to ascertain the time of day at the distance of the average pupil from the blackboard. You will feel the tension of your muscle of accommodation at the first glance, even if you succeed in reading the figures on the dial. Yet your childrens' eyes are subjected to this inhuman strain for ten years of their life.

If blinds are used at all, they roll down from the top, and either aggravate the condition, or shut out part of the light from its best point of entrance. They should, of course, roll up from the bottom, in order to afford protection to the children's eyes. The windows, of course, should be on one side of the room only, or be placed so high that the glare would pass over the childrens' eyes, and the desks should be arranged so that light would come from the child's back and pass over his shoulder to the book or blackboard.

We ridicule the Chinaman who pays his doctor to keep him well, and who rolls his window blinds up from the bottom, and who does everything just the opposite from the way we do it; but the slant-eyed celestial exhibits a sound common sense which we westerners would do well to humbly imitate in these things as in many others.

I might take up the illy-adapted seats, which cramp the chests, hump the shoulders and strain the eyesight. I can name a dozen flagrant abuses common in every schoolroom. But my purpose is not to be a pessimist, or, as our school children now say, a "knocker," but only to make you consider actual conditions and to take steps to remedy them.

The United States has twenty-four and a quarter million pupils in her public schools, and for their education $401,397,747.00 are expended annually. Pennsylvania alone spends $42,647.00 each year in maintaining her schools. We have ninety millions of people. Our orators declaim about such glorious statistics and we applaud.

Let me mention a few statistical facts, of which I am not proud. Out of our ninety million people, twelve million are ill during the year, and two millions die. Deducting the deaths from old age, the most of those remaining could have been prevented. Doctors call them "unnecessary deaths." There are eight million people now living, who will die of tuberculosis. One hundred and seventy-five thousand died last year of this disease. Yet tuberculosis never occurs under hygenic and sanitary conditions, and when it does assail a victim, hygiene and sanitation will save him, if he subject himself to their rules while the disease is in its incipiency. Tuberculosis is preventable.

There will be over two hundred thousand cases of pneumonia in the United States this winter, and over 50,000 of these patients will die. Yet pneumonia is a preventable disease, and never strikes unless the victim has violated the known laws of hygiene.

The comparatively mild diseases of whooping-cough and measles cause more deaths than the deadliest diseases we have—scarlet fever and diphtheria—yet they are practically preventable.

Every case of typhoid fever is a crime for which some one is responsible, and a knowledge of hygiene and sanitation among the people would enable us to blot the name from our catalogue of diseases, for it would become unknown. It is easily preventable.

There are very few diseases that are not preventable. Hygiene and sanitation will prevent the vast majority of sickness and pain. Is it not a matter of importance that our children should learn the principles and laws of the system which has such beneficent possibilities? But teachers who do not have this knowledge cannot impart it, and teachers will not equip themselves with this information until it is demanded of them.

What can you do, you ask? You can do much. Protest to the Department of Public Instruction against the false physiology taught in our schools, and demand that the curriculum be modified to a rational basis, so that our children may be taught hygiene and sanitation—sense, instead of nonsense. Implore the school board to instruct the teachers to ignore, so far as possible, the physiology now prescribed for the state, and substitute therefore a plain, common-sense teaching of hygiene and sanitation. Any teacher can teach hygiene and sanitation from any competent text book, but no teacher can teach physiology properly unless she is a graduate of a good medical school and has practiced medicine for a number of years.

You can visit your schoolroom, and try to help the teacher devise a means of deflecting the light which is blinding your children by its glare. You can supply your own children with individual cups, and ask the teacher to require all other children to have them, and to prevent any child from dipping his cup into the bucket. Think upon conditions in many schoolrooms today, even where there are a few individual cups. Those who do not have them, use a common cup, and dip it into the bucket, the clean and the unclean, black and white, healthy and diseased, cheerfully depositing the germs and filth from their hands upon the sides and rim of the cup, and then washing it off in the fluid your child must drink.

You could insist upon the school board providing desks which will not crumple up the chests and starve the lungs of the children. You could see that an inexpensive system of ventilation is installed—your doctor will be glad to look at your schoolroom, and instruct you how this should be done. You could take a few flowers in the coming spring, and plant them in the bare and cheerless playground. Oh, there are a thousand things you can do to mitigate the condition of these poor children, if you only will.

If your cow contracts tuberculosis, or if one of your swine becomes ill, the afflicted member is accorded the attention of a member of the President's cabinet. If your apples develop an imperfection, you can summon, without cost, the vast machinery of this mighty government to your aid. The ailments of trees, and the indispositions of hogs are matters of national importance; the diseases of clams and fish are held to be deserving of the closest study of highly salaried government officials; but when a human being sickens and dies of a preventable disease, there is no visible excitement about Washington, D. C.

This great nation, with such a splendidly developed governmental machine that it can catch a mail sack, dig a Panama Canal, manouvre an army along a whole frontier, or chase a plant louse, and do it all with the same power, grace and dispatch, has no provision for caring for the health of its people. Ohio can dump her sewage into the Mississippi to poison the people of Louisiana; New York can dump her refuse upon Pennsylvania, and the government cannot prevent it. It is a notorious fact that the government cares for a sick hog and ignores a sick citizen.

There is at the present time pending before Congress an act known as the Owen Bill, which provides for a National Department of Health. It is the duty of every good citizen to write to his Senator and Representative in Congress and urge upon him that he vote for and work the passage of the Owen Bill. This action is imperatively needed, for against this bill are arrayed all the fanatical and ignorant sects such as the Christian Scientists, Osteopaths, and backed by the money of the patent medicine and dope distributors, they are putting up a powerful fight against the protection of human life and the health of mankind. Your duty here is as plain as it is in your own school district.

MRS. FOULKE: We are now at the end of the program and will adjourn to meet again tomorrow at 9.30, to which meeting I hope all the ladies will come, as it will be the first meeting at which they have been present.

We will now stand adjourned until tomorrow morning.

Thursday, May 23, 1912, 9.00 A. M.

Mr. A. T. Crittenden in the Chair.

The CHAIRMAN: The meeting will please come to order. Mrs. Foulke said last evening that the Chairman should not have much to say, so I will simply introduce to you the first speaker, Dr. J. D. Detrich, who will talk to us about the "Importance of Field Workers for the Development of Better Methods in Agriculture."

Dr. Detrich spoke as follows:

BETTER METHODS IN AGRICULTURE

By DR. J. D. DETRICH, Chatham, N. Y.

I am here to speak to you on a very familiar subject this morning—the subject of better methods in agriculture. The interest taken in this subject shows how vital it is. All the agricultural agencies are working together for the purpose of devising better methods of work on the farms, and there is no feeling of antagonism between me and these several agencies. There is no feeling of antagonism between me and the agricultural college or other medium of higher education; we are all working along the same line, and toward the same end. I believe the solution of the problem lies in the Experiment Station, however, rather than in the school, because there is a vast chasm between the college, and even between the Experiment Station, and the man on the farm. There is no mistake about it. They do not reach him by personal contact. and the farmer gets these bulletins and he may read them, or he may not. If he does, he reads them during his long winter evenings, when he has little else to do, and then lays them on the shelf, and when the times comes to put them into practice, he has forgotten all about what the bulletin told him, and goes on farming in the same old way that he has followed year after year.

The subject on which I am to speak to you will be taken up by me entirely as it relates to dairy farming. That is a subject on which I am at home, because my experience has been entirely along this line, and I am going to talk to you of my own experience, and not about theory. It was because of the fact that I have worked out my theories, and reduced them to actual and successful practice, that I have accepted this position with the Borden people, having just finished writing a course for the I. C. S. About the time I completed the writing of this course, a representative of the Borden Company came to me and asked me to deliver four lectures for the Company. I told him I would gladly do so if we could arrange the details. Two days afterwards I received a letter from the Treasurer of the Company. He ask me to come to see him and I went. We agreed on the four lectures, I to be allowed to choose my own subject. Then I began to speak to the farmers who furnished the milk to the Borden people. They crowded around me, and the Borden people came from New York to hear what I had to say. The Secretary had a horse and buggy and drove me round to meet many of the farmers.

After I got through with my first lecture, a gentleman of the Borden Company asked me to deliver that same lecture again. I did so. After I got through with my lectures, I received a letter from them, asking me to write a series of articles which they would have published, and requesting that I continue to work for them. I wrote back to them that the bulletins that were already published covered millions of subjects, and there were cartloads of literature already on hand covering every phase of agriculture and they didn't appear to do any good, so I considered it a waste of time and money to try to add anything further to what had already been published, and referred them to the course I had just completed for the I. C. S. Then they wrote me, asking me to take up field work for them. They decided it was necessary to send a man right into the field, to go out to the farmer in his farm. I told them I was engaged in Institute work in Pennsylvania, but they wrote me to come to New York to meet some of their officers. I went to New York and met some of their higher officers and they told me I had given them a great deal of information and they wanted me to take up field work for them and teach their farmers how to grow and feed dairy crops properly. I told them I would be willing to take up this work for them provided I didn't have to work under Dr. Nevins. They told me there would be no trouble about that. Then the officer of the Borden Company stated his proposition, and I listened to it. After he was through I said, "Now I'll give you my proposition; I will work for you provided I am allowed to do it in my own way. I will take up the work in one county and divide it into four parts, according to the four points of the compass. This will give me a radius of about seven miles each way, north, south, east and west, and give me about a hundred farms to look after, and I will guarantee that in three years' time I will have an average of five cows increase on each of these farms." I wrote out my proposition, and they signed it, and I signed it, the time to be one year. Finally, they concluded to make the time for three years instead of one year. Gentlemen, before that year rolled round, they came to me and said, "We want to make another arrangement; we want you to stay with us." I have now been with them two years the 23rd of last March and the results are beginning to show splendidly.

The Borden people are splendidly fitted up for this kind of work; they have every railroad facility and a factory fitted up for the production of a high quality of milk.

The first thing I did after looking over the ground, was to tell them, "You have switches into the factory; why not utilize them in buying fertilizer and feed and seed for the farmer and make this a distributing point?" The Company was in position to get a better quality and a better price than the average farmer, and I suggested that instead of buying the stuff branded "fertilizer," the Company buy soda and phosphate, and nitrogen, just the raw material, and let the farmer do his own mixing according to the formula which I would give him, and thus be the gainer in quality and in price. They accepted the suggestion, and it has worked out splendidly. We found that for feeding stuffs the farmer was paying five dollars a ton more than we were, and this ratio held good in everything else.

At these factories of the Bordens' they have superintendents, and under them are inspectors who go round from one farm to the other to see that the cows and the stables are kept in proper condition, and the inspector for this district would take me to the different farms, and he told the people that the Borden people were sending me out over the county to show the people how to raise dairy crops. In this way we visited over two hundred farms, and every one of them was ready to receive me with open hands—not always ready to endorse all I said, but they received me very pleasantly. I asked them, "are your pastures good in summer?" "Oh, yes." "How about your cows in the winter; are they dry?" "Oh, yes." "Did you ever try oats and Canada peas?" "No." Or, perhaps, "I have tried them, but they are no good," or, "I have tried them but they don't seem to do well with me." I told them, "Try it again, and do it in this manner: put just so much fertilizer to the acre; I will show you how to mix them, and if you will follow my instructions I will guarantee your crops."

I don't believe in chance farming. A man has no business to be a farmer if he depends on chance, or on seasons to do his farming. In order to succeed, a man must prepare his soil, use sufficient fertilizer to enrich it and enable it to retain the moisture when the dry season comes, so that the seed can grow and not burn up. I am not advocating anything new. The Agricultural College, the Experiment Station and the Institute lecturers have all told the farmer these things time and again, but do you see what it is? The farmer is not a man who understands reading a book; if he does read it, it confuses him, but if you go to him on his farm and tell him how to do a thing, and when to do it, he begins to understand, and what is the result? His crops are sown intelligently, and they cannot fail to produce properly. A man who takes this position of field worker, must know the soil and the market, and he must be able to go to the farmer and tell him "this soil needs phosphate, and this one needs nitrogen, and this one needs potash." I have done this in my work for the Borden Company, and what has been the result? I didn't make a single failure in the one hundred and fifty-seven farms I superintended last year. Every man who put in his crops as I directed, got a good crop. The man who does not mix them properly, or who puts them in and covers them lightly with a harrow, need not expect results. I like to have a failure occasionally, so that the man who makes it will learn the lesson not to do it again. Too many men go half way about a thing, and then blame everyone and everything but themselves for their failures. It is the practical way of doing a thing, the technique, the only way to do a thing, that can produce results. Time and again a man has plowed with the strap too lose, with his horse not properly hitched, so that one horse works with a brace that is too long, the other that is too short, throwing all the work on one horse. It is like the physician coming into a house. We go out to these men and tell them what to do, but we can't make a success where people go contrary to directions. By the failures they make you can get an insight into people's lives.

You take just one thing at a time; that is the beauty of this work. First, oats and peas. I never talk ensilage until they have mastered oats and peas. Have grain enough to feed your horses, and to sell. The same thing with the hay. On one of these farms that I went to, I found the man just unloading hay. I said "that's very fine hay." He said, "Yes, that's the trouble; your cows like it so well that they eat too much, and there is none left to carry them over winter; and I don't know what to do next year." I asked "Why?" He said, "My seed didn't come up." I said, "Put in another crop." He said, "This is no time to sow grass seed; this is July." I said, "Sow it anyhow." He said, "Why I never heard anything like that; you don't know what you're talking about," and turned again to unloading his hay. I talked to him awhile, and said, "You sow that seed as I tell you, and I'll guarantee your crop." He said, "You talk too much, but," with a very firm look and using an oath, "I'm going to do it just to show you that you're lying." I merely smiled at him, and gave him very explicit directions. I haven't seen the man since, but I learned from the Veterinary that he got his crop, just as I assured him he would, and is now starting a new field. I am citing this simply to show what a man can do if he is only taught how to do it.

After I had them educated into oats and peas, I began to talk ensilage, and then the silos began to go up. At first there was a strong prejudice against it. One man told me that silo would rot the cows' teeth, ruin her stomach, and cause her tail to drop off, but these prejudices have been very largely overcome. I don't know how many silos are going up this year, but the number is increasing right along. One man last year showed me a field, and asked me "what would you recommend me to put on there?" I told him exactly what to do, and since then I haven't seen him, but he asked the Veterinary, "Where is that old Jew with the whiskers on? He told me so many good things last summer that I want to talk with him again."

In addition to purchasing the seeds and fertilizer the Borden Company spent $18,000 for farm papers to be spread among the farmers. Everything that is possible, is done to bring about better methods in agriculture, and the results are beginning to be apparent, especially at Chatham, even though the soil there is rock, rock, rock, stone, stone, stone. Last Fall one of the officials of the Borden Company came out from New York and looked over the farms under my supervision, and after he had gone over them he said to me, "The Borden Company is very grateful to you." Gentlemen, it is the highest compliment I ever received in my life.

Instead of two, four or six cows on the farm, they are now double, because of the ensilage. When hay is $25 per ton, the farmer can depend on his ensilage, and need not worry about the price of hay. A farmer said to me recently "I depend upon my ensilage and oats and peas, and I don't know what I would do without it. I have sold twenty-five tons of hay, and have fourteen more to sell, at $25." These are some of the results of the field work I have done for the Borden Company.

It is nonsense to talk about the advertised registry of a cow, and it is nonsense to talk about pure-bred stock without feed. The first thing towards a good herd is to teach the farmer to develop his grass, and as he develops that, he will get more milk, and more milk means more money with which to buy more and bettter stock.

When Mr. Martin first wrote me to come and speak to you this morning of my work for the Borden people, I tried to excuse myself, but he wrote me again to come and tell you of this work, which is the reason I am here today.

I can very well see how this movement can be extended so as to benefit the farmer. I can see how the Grange and the Farmer's Club can buy in quantity just as well as the Borden Company can. I can see that through these organizations the farmer can buy his seeds and feed and machinery just as well and just as economically as our farmers can through the Borden Company. Why, some of our farmers paid $2.40 for peas in Albany that we have been selling them for $1.85. We give the farmer the benefit of these prices, and, in addition, we give him the value for his money.

The question comes up, Would it not be too expensive for the State to have a field man out? The College has its "Farmers' Week," and the farmer can go there for a few days and receive instruction in the proper method of doing things, but even that doesn't reach the individual. The field worker can go out to the farmer, and see his soil, and learn his individual problem, and then tell him just what to do. admit it is more expensive than the other way, but I believe it is the only way to produce results. Take one good man, and let him go to college, and then send him out among the farmers to give them the benefit of his scientific education and experience. The average farmer is not scientific; he doesn't go to college; he is simply a bread and butter farmer. He knows nothing of De Kalb soil and Volutia soil, and we do not tell him that oats and peas is a plant food, or that clover will enrich the soil. We simply say to him "here is the one thing you should know; just do this, and you cannot fail to get results." These men can't go to college, but they must be taught better methods of agriculture than they are now practising. It will take three thousand dollars a year to send a man out in this way. If you take the horse hire and traveling conveniences and board bills into consideration, you will see that it will run into the thousands, to run a hundred farms on that principle, but in a year's time you will find it reaching out wider and wider.

The Borden Company, when I began my field work, asked me to prepare an article every week for a certain farm paper. I said, "That is wrong, when I have nothing to show. When we get crops, then we will have something to show as an object lesson." They kept after me all summer, but I finally convinced them that I was right. In the fall we had a fine show of crops, and this spring I consented to write for the paper. They now write me that they wish these articles continued under "Farm Reports, Institute and Field Work."

Last fall after the field work was over and I had nothing to do, I looked over the Borden farms. After going over them very thoroughly, I wrote the Company that I thought there should be a general overhauling of the whole concern. They wrote me that they were a little surprised at that, but gave me permission to make any changes I saw fit. I went to the superintendent and told him how I wanted things done. He resigned. Then I went to the men, and told them how I wanted things done; the first one I spoke to said "I won't work for you." "All, right, "I said, " you can quit right now;" "but," he said, "you won't have any one here to milk." I said, "I won't have any trouble in finding some one." The kind of men who leave you are the kind whose place you can always fill. My experience has been that when a man leaves, I can always find a better one to take his place. The first month I showed a profit on the farm, and in the month of March they got a profit of $556 from that herd. I heard a man say, "There is no profit in farming today." There isn't in carelessness and recklessness, but where we have scientific farming reduced to terms which the everyday farmer can understand, it is profitable, and I don't know of anything that is more profitable in the outlook than dairy farming. I know there are men who abuse it, who abuse farming, who abuse the Bordens and who abuse me, just as there are men today who will get two tons of hay to the acre where other men are producing four tons to the acre on land that no one would take to be grass land—all due to the plant food they have put into that soil to hold the moisture.

On this farm of the Borden's, when I went there, there were eighty cows; in a week or so, there will be five hundred head of cattle right on this same farm.

MR. BARNES: On low land, as wet as the season has been this year, would it be safe to prepare the soil to get it in shape for fall seeding?

DR. DETRICH: Drain it, and then prepare it in the regular way, and follow up your crop with another of the same kind. I don't believe in rotation; it comes from a Latin word which means a wheel. Where one crop will grow and succeed, another will do the same. If you put in oats and peas and it is not drained—where do you live?

MR. BARNES: York County—eighteen miles northwest of York.

DR. DETRICH: Then sow clover, timothy, alsike and redcock about the 20th of August in your county, and get your soil in shape, and I will guarantee results if the soil is made rich enough.

A Member: What is your theory about planting oats?

DR. DETRICH: I don't doubt some men will get results by running it in with a loose harrow, but I want a maximum crop. Peas I want to drill in three inches deep; oats only one and a half inches. You can plow the peas in so that you can get them four inches deep, and be well covered. Be sure you get them well covered. By following this rule, I never missed a crop in my life.

I have in my pocket a leaflet, which the Borden Company has issued. They want the Veterinary and me to go out to every meeting where the farmers who produce milk for the Borden Company go, and after we have talked to them, they want the farmer to take this little leaflet home with them. It can only be used in field work, and it is merely a summary of what has been told them, so that they may have it for reference. It is called "The Use of the Silo." We do not use anything in book form; simply this little leaflet. I believe it would be a very good idea for the Institute workers of Pennsylvania to emphasize the principal points of their lectures in the same manner—just a little leaflet of two pages for the farmer to take home and carry in his pocket for reference when the Institute is over. A man told me he had built his silo by following exactly the directions of the leaflet. I saw him afterward, and he told me, "I hoped you would come out to see me so that I could talk to you about it before I began." I told him I had been there, but he wasn't at home. He said he was very sorry he had missed me, but he went right ahead and built his silo according to the directions of the leaflet, and it was all right. He was an Englishman, and had never seen a silo before I came there.

MR. HALL: In growing oats and peas, is it better to put them in a week or ten days apart, or at the same time?

DR. DETRICH: Put them in at the same time.

MR. HALL: How do you sow the grass seed?

DR. DETRICH: With a grass seeder; but you can sow it any way, so long as you get it well covered. You must be sure you get the seed well covered.

MR. HALL: Is it safe to use a harrow?

DR. DETRICH: I would not use a harrow; the only safe time to use a harrow is immediately after plowing.

MR. KESTER: All these things are very interesting, but it is hardly in line with the subject on the program.

The CHAIRMAN: It is strictly in line with it.

A Member: What percentage of the Borden farmers are growing alfalfa?

DR. DETRICH: I don't advocate it one bit. Everybody is advising every farmer to grow alfalfa, but you can't make me believe that alfalfa will grow in poor soil. First, get your soil in shape, and then it is time to talk about alfalfa.

A Member: How do you cover your seed when you sow it?

DR. DETRICH: With a light harrow.

The CHAIRMAN: Mr. Lighty, the next speaker, is unable to be here because of the sickness of his wife, but he has prepared his paper, which will be printed with the proceedings.

Mr. Lighty's paper follows:

THE IMPORTANCE OF FIELD WORKERS FOR THE DEVELOPMENT OF BETTER METHODS IN AGRICULTURE

A DEMAND THAT IS NOT MET

By L. W. LIGHTY.

I have watched the progress of agricultural investigation, information and practice for more than a quarter of a century and I am delighted with the results so far, but I am convinced a new step is imperatively demanded at this time.

The farmers institute movement has accomplished great things in this country. It has spread and made popular scientific agricultural information that but for this work would be absolutely unknown to the masses of farmers. The earnest conscientious institute worker, and there are many of them, collected, studied and applied in a practical way as many of the scientific facts set forth by the various experiment stations of this and other countries as it was possible for him to use on his farm and when he had all this matter well in hand he could go before the farmers and talk about it familiarly and practically. It is one thing to know a fact and quite a different matter to apply it practically and profitably in business.

What is called for now is an extension of this work so as to bring the best and most practical information directly to the farmers field and stable. In my institute experience I find at every point a number of men who have problems that it is difficult or impossible to solve at long range and they insist I go home with them and give the needed assistance. This is all well enough but a man's time and energy is limited. During the last few years I did a limited amount of field work in a private way and during this last year I hung out my shingle as Agricultural Counsellor. This personal experience gives me an idea of the demand for this work as well as a rather clear conception of the requirements of the people who call you to counsel and advise. I find this to be true generally, the farmer is a very busy man and does his reading hurriedly and gets a very hazy idea of what he reads. He is not an expert listener to a lecture and though he hears it all he cannot get the gist of it because he has so little training in this line. I believe there is everything in the farm papers and the institute lectures and the experiment station bulletins that any advisor can give the farmer *only the farmer is unable to organize the ideas and put them into pratice on his farm and in his business and it is the business of the Agricultural Counselor to do this and do it in a way that will accomplish results under existing conditions.*

It is easy to talk about a thing you have prepared yourself to talk about and it is quite a little easier to write about it as I happen to know by experience but when you step on a man's farm and he pays you good money to tell him how to do better, more profitable and successful work on that farm you are up against a proposition where glittering generalities will not go the length of your nose. You know or you don't know and he will soon know too and if you do not know, better make a clean breast of it and say so in the beginning.

The first essential, absolute essential is that your client has faith in you. If you cannot inspire faith in your client your effors will be a failure. Right here we come up against the proposition of finding and securing the services of capable farm counselors and advisers. Let us use caution and not bring a worthy cause into disrepute.

QUALIFICATIONS OF THE FIELD ADVISERS

Our National Congress is wrestling at this time with an appropriation bill to enable the Agricultural Colleges to do some of this sort of work and I hope the bill may pass and the money may be wisely used, but I want to admonish the handlers of this fund to be cautious in the selection of men to do the field work. The farmer is a mighty peculiar man just as is the college man. The college man has his serious suspicions about everybody's abilities unless he has a so called college training and the farmer has his suspicions about every body who has this training. I am talking about the rank and file now, there are exceptions of course. Personally I believe a college training is of inestimable value in this work. I may over estimate it because I do not have it. I have heard some of our foremost business and literary men say it took them years to live down the dependence on so called authority instilled in the lecture and class room and acquired the power of personal initiative so absolutely necessary to a successful career. I do not believe a college training is absolutely necessary for this work but I am convinced *that practical successful experience is absolutely necessary in the Agricultural Counselor or field adviser.*

The man who has not had some years of practical experience in the orchard, the dairy or the market gardening field in a commercial way cannot know the many details that are absolutely essential to success as well as the practical business propositions that must be met from time to time and most assuredly what a man does not know himself he cannot counsel another on. It looks now as though the men qualified for this work could not be found, but no doubt the demand would bring a supply at least the demand would lead men to prepare for the work.

SHOULD PUBLIC MONEY BE APPROPRIATED FOR THIS WORK?

There is considerable money appropriated now to our National Department of Agriculture to make investigations on a large scale for the benefit of agriculture. Public money is appropriated for the use of our experiment stations to do experimental work and also to do some original research work. Money from the public funds is appropriated for institute and extension work.

Why? Because the great majority of intelligent people in this country are convinced that the continued prosperity of the nation depends of the prosperity of the farmers of the nation and it is a self evident and undisputed fact that agriculture is successful in the measure of the general intelligence of the men who are engaged in the vocation. Therefore considerable public money is appropriated to develop improved methods of farm operations and some of the funds are used to get those methods before the farmer. This idea of field work or local demonstration work is simply another form of extension work and a form by which more actual and real practical good can be accomplished then by any method that has been tried to this time. This is my conviction from the little experience I have had.

We are convinced the fertility of our soil should be conserved. We know many soils do not yield maxium crops. We daily hear the cry of the high cost of living. Also the "rural uplift" orator tells us a woeful tale. We are aggravated almost beyond endurance at the fearfully bungling and unskilled methods of marketing our products because of our lack of cooperation.

The field worker has an unlimited task if he is equal to the occasion.

THE VALUE OF FERTILITY

Fertility is fruitfulness, the antomym of the term is aridity. Many millions of acres in northern Africa are so unfruitful that none of the land greedy nations of Europe lay claim to it. In our old maps it was marked Saharah.

In my short life of a half a century have seen nice large farms that were phenomenally fruitful so abused by lack of information of the owners that today they are practically abandoned. I am speaking about farms in York, Adams, and Philadelphia counties. These farms in these rich counties are abandoned because they have been rendered unfruitful because of ignorance of good farm methods. Many farms in this State and all over the country are going the same way for the same reason. You can answer the question for yourselves if it is good policy to make a strong personal effort with state funds to evert the calamity of having thousands of abandoned farms for lack of a little information. It is said 16.000 are listed in New York State. The great speeches by our national leaders on soil conservation have their value but they never reach the man who must do the actual conserving if it is to be done. You get your field worker next to that man in the field and there show him the correlation of organic matter, moisture, lime, potash and phosphorus to the production of legumes and there in that field demonstrate for all that neighborhood, the indisputable truth of your doctrine and you have done more for that neighborhood then all the great speeches that all the great men can make until doomsday.

HIGH COST OF LIVING

Some of the great authorities tell us it is a serious "muchness" of several articles that causes the high cost of living. Too much gold; too much tariff; too much trusts.

I am not a political economist and will not kick at the authorities but I have my ideas and I sometimes express them. The reason we farmers had to pay the unheard of price of 25 cents a pound for clover seed this Spring was because there was not enough clover seed in the country to reach around and a number of farmers did not get any. The reason the city man has to pay $1.00 a bu. for corn and $1.75 per hundred pounds for hay for his horse is because our cribs and mows are empty and we do in many cases not have enough for ouselves. The reason the city man has to pay 25 cents a pound for beef is because we have to feed dollar corn and $1.75 hay to make the beef and we are not making much. There isn't enough to go around. Now this may be political economy but I know it is true. Let me say here to the wise ones who theorize much also to the other ones who do things that if you would reduce the cost of living you must produce more of the stuff folks live on and you must reduce the cost of production and you must devise some method that is less expensive getting the stuff from the producer to the consumer.

One word to the "rural uplifter." The farmer wants the good things of life as badly as any one I know of. He wants the household conveniences, he wants good roads, he wants the telephone, he wants the automobile, he wants the civic centre with its school, library and art gallery, but the first thing he wants is "the dough." Enable the farmer to handle the forces of nature about him to his advantage and enable him to get his products to the consumer without handing to the middle men 66% of what the consumer pays, in other words enable the farmer to make money in his business as do the men who handle, manipulate and transport his products and he will so quickly have the good things of life as to take away the breath of the "rural uplifter!"

I am not finding fault with any ones efforts, but when I see folks trying to lift themselves over the wall by their boot straps I beg of them to desist.

A FEW INSTANCES OF PERSONAL EXPERIENCE

Several years ago Mr. J. called me in to help locate and plan a silo he was about to construct. Rather incidentally we looked at a field that gave him much trouble in wet seasons. I suggested tile drainage and he was at once interested. I located the ditches and gave instructions for digging, laying the tile, making the outlet and covering the tile. He followed instructions and did the work at small cost. I quote from a letter I have on file from Mr. J. to show the results from a very insignificant beginning:

"I want to thank you for inducing me to put the bottom of the silo level with the surface of the soil and locating it so near the feeding alley, but what I want to tell you about more particularly is the value of those tile drains. I have had no trouble with that field since, either in plowing or cultivating and I am sure I made ten dollars for every dollar I spent draining it. A number of my neighbors are also putting in tiles where the soil is wet and troublesome. The car-loads of drain tile came to our station this Spring."

I could cite a number of instances to illustrate what a little leaven will do for a neighborhood, but one more must suffice. Mr. Y. was thinking about a silo for some time, but there being none in his neighborhood he did not feel like taking the initiative for fear it would not be a success, but wrote to me and later asked me to come to his place. He needed a silo and I persuaded him to erect one, helping him to locate and purchase it. He was highly pleased after using it a season and interested his neighbors so much that five of them put up silos, he taking the agency and this cooperation saved the men a few hundred dollars. Here a little outside help so enlightened a neighborhood that six men are now producing dairy and beef products at a great saving enabling them to make money they could not make without the little item of outside assistance. In this work we meet cases where a reorganization of the entire farm management (or mismanagement) is required down to suggesting one or a few items of change and improvement. It is well for the adviser to remember that it it is very easy to suggest too many or too radical changes and his client cannot carry out the instructions.

THE FIELD ADVISER'S OBJECTIVE POINTS

The good mechanic always has a very definite ideal picture in his mind's eye of the product of his labors before he begins. This same must be true of the field worker, agricultural counselor and demonstrator. You must have objective points and then make it your business to arrive.

The first object should be a more fertile, a more productive, a more fruitful soil. This is the corner-stone of your structure and if badly laid the whole structure will fall and the ruins will be appalling.

The next weapon you want to put into the farmer's hand is the ability for cheaper production. A productive soil is one means, but there are many others as the use of the silo, the intelligent use and care of labor saving machine, correct rotation of crops, adaptability of crops to soils and markets and many other items.

First then we produce as much as we can on a given area and do it at as low a cost as possible. But I will say here most emphatically, valuable as is this part of the work it all amounts to very little unless we can help the farmer to get to the consumer with his products in a more business-like way then he is doing now. So long as it costs from 50 cents to 67 cents and even more to market a dollars worth of products the farmer's business cannot be profitable and he will desert the farm and go to the city in a steady stream as he has been doing for the last quarter of a century. This is a mighty problem and calls loudly for solution and if we cannot help the farmer solve it we had better stop talking and do some thinking for a spell. I am not here to call your attention to its great importance. I will say incidentally that intelligent cooperation of the farmers will go a great ways in its solution. We will have cooperation discussed by able men at the next session and they will doubtless completely cover the ground, but I am speaking now of field workers, counselors and demonstrators and they are to do, act and accomplish things instead of talking about them. They must convince the farmer that the promoter's cooperation and real co-operation for mutual benefit is vastly different. They must by exercising a true missionary zeal instil into the individuals they come in contact with the true spirit of cooperation. I have no set of fixed formulas for the accomplishment of the desired results, but I believe what other countries can do we can do. Several northern European countries and the continent of Australia has great and forcible lessons for us if we are teachable, which look doubtful at times. In many sections almost every farmer is interested in dairying and in these sections the cow testing associations can be made to bring big financial returns to the farmers and at the same time show the farmer how to cooperate practically and successfully. This is a work of the utmost importance and should certainly not be neglected any longer by the State of Pennsylvania. Milk and its products constitutes very largely the food of babes and invalids and enters largely into the nourishment of all the people. It is of the utmost importanc that this food be produced under the best and most sanitary conditions, but this will never be so until the business be made more renumerative then it is at present. In Denmark, Sweden and several other countries the state is lending its assistance in the initiation of this form of cooperation of the farmers with results so profitable to the farmers as well as the state as to be almost incredible. It is my sincere conviction as a student and dairyman of 25 years experience that our State cannot invest any money to greater advantage than to put efficient workers in the field to organize cow testing associations and so assist the associations that they can do the best work. Money wisely spent for this kind of work will yield 1000% interest annually for the producer, consumer and for the State.

The CHAIRMAN: Is Mr. Willard Young here? It appears he is not, so I will take the liberty of calling on Mr. R. P. Kester to continue this subject.

Mr. Kester spoke as follows:

ADDRESS OF MR. R. P. KESTER

I feel like apologizing to the Chairman and to this Institute for the interjection I made a few minutes ago relative to the pertinence of the inquiries to the subject. I really did not expect to be called upon to speak this morning, and I have nothing whatever to talk about. I do not know that Dr. Detrich has left very much for me to say. From my own experience and observation, I am inclined to believe that there is a very real need for the line of work suggested by this subject and by the new Federal bill now before Congress. I talked the other day with a man who asked me where I was going; I told him I was coming here, and he wanted to know what was the purpose of the State Board of Agriculture and the Normal Institute, and who paid the expenses. I told him the State paid the expenses; and then he mentioned the fact that this money came out of the taxes paid by the people, and said he didn't think it right for the people to be taxed for the benefit of one set of men and one kind of business. In talking with another man in reference to field work, he made the same objection, and you will find, ladies and gentlemen, that there is some objection on the part of the unthinking people to the help that is being extended to the farmer at the public expense; but I think that a little thought on the part of any one would make them wise to the fact that it is not class legislation, but to meet a growing demand for more food and lower priced food, for the best of the world's things not only by the farmer, but by those for whom the farmer produces, and when we help the farmer we are indirectly helping the consumer to get these things. It is an economic question, not an individual or class question.

That the farmer is not producing more per acre, more eggs from his poultry, more milk from his herd, more potatoes from his ground, is not because the farmer doesn't work hard enough or long enough; he does the best he knows how. Nor is it because our State College and Experiment Station have not done excellent work; but it is because the farmer does not know exactly how to apply what he has heard and has not the time to study it out. It takes some one to interpret it to him, and to go out and show him just what would be the result of these things, and how best to apply them. Whether this should be done at the expense of the public or not, it is something that concerns the public as a whole.

I have had some experience in standing upon the platform and trying to teach men how to do things, and why to do things, and when to do things, and just as soon as I get through some man will come up and ask me how or why. If you can go out into the fields and show him, he will be able to do it as well as you can. For some years I spent some time in teaching, and have some ability as a chalk artist, and I find that things taken in through the eye have a better effect than if they are received through the ear alone. We can get a better impression through the eye, than by argument alone. So I believe better results will be achieved by field work than by simply talking to the farmer from the platform.

A great deal of the legislation that was enacted in Congress this last winter pertained to agriculture. One bill appropriated, I believe, some six hundred thousand dollars for State work, and they are taking it up all over the United States, which shows that the people everywhere are beginning to realize the necessity of this field work.

I realize that the field worker must be something of a diplomat; he must have a wide general knowledge, and must know how to handle men. To the boy who goes to State College and then comes home to help his father to better methods, it is to him that the field worker will be of the greatest benefit. I want you to be sure that while you are talking to the father, you get the ear of the son, and the boy on the farm will be more apt to adopt himself to new methods than the older man. I believe that the people of the country want knowledge and want information, but they want to be sure that the man who is giving it to them can meet the final test. I believe the experiment is worth trying, and I believe that this institute will reap its best results from the men and women who go out and show the farmer how to do, as well as stand on the platform and tell him how and why.

DIRECTOR MARTIN In looking over the audience, I find that we are honored by the presence of Captain Ainey, the Congressman from this district, from whom we expect a great deal. We shall be pleased to have a word from him. He will please come forward.

Captain Ainey spoke as follows:

ADDRESS BY CAPTAIN AINEY

Ladies and Gentlemen: I feel sure that I have your sympathy in being called before you at this time. I just came into the hall, and was engaged in conversation, when I heard my name mentioned, and some one told me I was called upon to come forward. I understand I am limited to about two minutes and a man can hardly get started in less than five minutes.

A few weeks ago it was my privilege to be down in the City of New York and listen to one of the most eloquent men I have ever heard—Rabbi Wise; he talked of Lincoln, and amused our hearts as he spoke of some of the magnificent characteristics of that man. Incidentally he told a story to illustrate one of his points, and to show the prejudice against the Jew. Patrick was taken very ill with the smallpox, and after a while he became so seriously ill that his wife thought he should have the last rights. "All right,,' said Patrick, "send for the Rabbi." His wife said, "The Rabbi? Why not send for our own good Father Moran?" Patrick said, "You would not have our good Father Moran catch the smallpox, would you?

I am not a farmer, and I don't know why I am at this meeting. I didn't come here with the intention of speaking, and now that I am speaking, I am not going to talk mere platitudes. I am not even going to talk from an economic standpoint, although our greatest American forces come from the farm, the sooner our people awake to that fact the sooner some of our great questions will be settled.

There was a time when 96% of our population was on the farm, or in the country, and then was the time when patriotism lifted her head, and men went out and exalted the name of our great country. I believe today that the greatest and best place where noble ideals are formed is in the country; you will find that a larger proportion of our great men come from the rural districts.

The first question that confronts us, is good citizenship, and the first great thought that must impress itself upon us is not merely "What can we get out of this country of ours, but what can we put in it?" With so many unworthy and selfish and grasping around us, this is a vital question to the man of worth and intelligence. I have great confidence in our rural population, but unless our cities, with their large mixed populations begin to realize their responsibilities in this direction, they will begin to go backward. And even in the country, because of the drift of the boys and girls away from the farm, rather than to it, the problem is becoming a serious one.

I am glad to have been here, and to have given these few words of greeting. In my estimation, we are going through the greatest trial now that this country will ever go through. We have changed our conception of things, and it is on the farm that the change of thought first had its inception. There will be a new adjustment of things, and the people will rule in fact, as well as in theory. There is a great bloodless revolution now going on, but the same Power that led our fathers through the wilderness, and through the war against slavery, will lead our faltering steps through this crisis now upon us. I believe in the greatness of the American people, and am convinced that it will emerge untarnished from the crisis through which we are now passing.

The CHAIRMAN: We will now take up the next number on the program, "Use of Dynamite in Farm Operations," with illustrations, by Mr. Willard Young.

Mr. Young spoke as follows:

USE OF DYNAMITE IN FARM OPERATIONS

By WILLIARD YOUNG, Wilmington, Del.

I want to say a few words to you this morning about dynamite. Within the last year or two dynamite has begun to be used for a number of different purposes which are very different from what it was first thought dynamite could be used for.

Dynamite is usually supposed to be a very dangerous substance, something not fit for the ordinary person to use. In a very few words, I expect to show you this morning that dynamite is not nearly so dangerous as is often supposed. There are several other substances fully as dangerous, or even more so, in common use, and very few people think of being afraid of them; take gasoline and coal oil, for instance. Dynamite is not nearly so easily exploded as either of these substances, even through negligence. Dynamite is a solid substance which amplified from eight to ten thousand times, according to the temperature in which it explodes. As originally made, it was dangerous to handle, and a very dangerous material to make properly. Now the manufacturers have learned to make it more carefully and more properly. It is more difficult to explode than it was years ago, and requires a stronger detonator. It requires either a six foot fuse, or an electric detonator, which is exploded with an electric current.

A few years ago the question of using dynamite for subsoil was first spoken of. I said I didn't think there was anything in it. I had been using it for blasting rock and coal, but one of our men had been using it on the soil in the West, and he thought there was something in it. So we began to experiment with it, and in many places we found it to be of very great advantage. I know very little of farming, and I suppose you know better than I do, the value of having the soil broken so as to hold water and keep it at the bottom, where it can be reached easily so as to produce rapid growth and get your fertility for your soil. We have used it for many years for blasting out stumps and rocks. I am often asked why I do not state exactly how much dynamite to use to a stump, and exactly how to do it, and exactly what the results will be. I have found, in looking up carefully the subject of stump blasting, that it is even more difficult to use it on stumps with economy than it is on rocks and stones. Every kind of a stump is different; the stump growth is always different, and the length and size of the roots has a great deal to do with the amount of dynamite required to blast that stump out of the ground. Dynamite always brings the stump out completely, very cheaply, and it also saves a great deal of time.

I find in most cases where men go out into the country to blast out old stumps, they cannot tell how much dynamite they will need until they have first examined the stump very carefully. Some old stumps are very difficult to blast out without two or more charges of dynamite, especially where there is a tap root. In a Southern Pine stump with a tap root, we always bore right into the root. A 12″ stump usually requires a 1½″ cartride—1½″ x 8″, of 40% dynamite. If the stump is very strong, we may use 60% dynamite. On a 40″ stump we may use three quarters of a pound of 40% dymanite. It is best to be careful in boring your holes for the cartridge, because if you are not careful you are apt to split the log.

Next, boulders: In blasting boulders, it is well to cover your charge of dynamite with mud. The next best way is to get a crow bar and pull your boulder out in that way, and the third and cheapest way, is to drill the boulder anywhere from 12″ to 2′ apart, 30″ deep, and load the hole one half full of dynamite.

After you have your trees and rocks and boulders out, you want your place ditched. We have learned that in many cases a ditch can be dug much better by planting charges of 20% dynamite 18″ to 20″ apart, and a detonator to work them, in the middle of the row; this will carry the effect to both ends. Dynamite carries much quicker in wet ground. In wet ground blasting bore the holes from 6′ to 8′ apart and put a detonator near the holes.

We had planned to have a demonstration on one of the adjoining farms this afternoon, but our dynamite did not come in from Wilkes-Barre. We have, however, secured some dynamite here, but we cannot use it as economically. We will, however, do the the best we can with it.

If you will follow the instructions of our factory, there will be no danger, but if you don't follow them there is danger. With even ordinary precaution the ordinary man may use it as safely as he walks along the street. I have handled it for twenty-five years, and used it in all its forms, without any trouble what ever.

A Member: Is there any trouble from headache caused by the dynamite?

MR. YOUNG: In ordinary cases it is better to wear gloves to avoid this; the nitro-glycerine become warm from the handling, and is absorbed through the pores of the skin; it has a tendency to make the heart beat faster, and forces a little more blood to your head, which gives you the headache. The workmen wear gloves, and have no trouble.

MR. HOLMAN: But if you get it near your face, it will give you the headache?

MR. YOUNG: Yes, if you rub your gloves over your face, it will give you the headache; the 20% is not so likely to do it as the higher grades—the 60%. And if it is warm and soft it is more apt to give you the headache. The glycerine alone would not do it, but the nitrated glycerine will.

I have arranged here to show you a few slides, which will explain things better to have than I can do by talking. It will not take much more of your time, and will give you a better idea of the use of dynamite on the farm.

At this point Mr. Young showed a number of slides, illustrating the use of dynamite.

DIRECTOR MARTIN: We will now stand adjourned for the morning. We will have an early dinner, after which we will catch the train at this point for Mr. Jennings' farm, a few miles out, and witness the demonstration of dynamite, getting back here at about half past one, to take up the afternoon's program.

The CHAIRMAN: The meeting now stands adjourned until this afternoon.

Thursday, May 23, 1912, 2.00 P. M.

Hon A. L. Martin in the Chair.

The CHAIRMAN: The meeting will now please come to order. We have been delayed somewhat in our opening hour by the excellent parade given us to show us something of the agricultural progress in Bradford county.

It was our intention to open the afternoon session with an address by Hon. Edward M. Bigelow, State Highway Commissioner. Is Mr. Bigelow present?

MR. FIRST: I believe he is in town, but he is not in the room.

The CHAIRMAN: Then, in order to save time, we will take up the next number on the program, and Mr. Bigelow will follow. Is the Committee on Co-operation ready to report? This committee consists of Mr. R. P. Kester, Mr. E. P. Dorsett and Mr. Archie Billings.

MR. DORSETT: We are.

The following report was read by Mr. Dorsett:

REPORT OF COMMITTEE ON CO-OPERATION

In submitting this, our first report, we realize that many men of influence in this country have in recent years and months turned their attention to co-operation and have been considering it favorably as a cure for many of our social, financial and political ills. Our purpose in submitting this report is to ascertain if a common ground could not be found upon which all co-operators and co-operative associations might stand and present a united front to the common enemy. We are within safe bounds when we say, that the sentiment for co-operation in the United States has developed more rapidly within the five years last past than it has during all the previous history of the country, and that this development in the future will be at an ever-increasing accelerated pace.

The great difficulty to its organized advancement in the past as well as in the present has been,

1. That the laws of most states have not been favorable to the progress of true co-operation.
2. That among would-be co-operators there has been no standard definition of what true co-operation means.
3. That co-operators themselves, interested in different working bodies, have never co-operated.

It is the purpose of your Committee in submitting this report, to lay a foundation for an attempt to remedy one or all of these conditions in the future. One fact stands out above all others in the agricultural world, and that fact is that the day of the small, detached, independent, go-it-alone-farmer is over. That he will persist as an individual for many years to come is also true, just as it is true that the more efficient horse has not driven out the ox as a motive power; yet the future is to repeat, unless all signs fail, the story of industrial organization combined in other lines.

The reasons for this revolution are not difficult to determine. Business, outside the field of agriculture, is fast passing into what we know as the "trust" stage; for not only do we find the internal affairs of the business placed upon the basis or maximum efficiency, but we also find that its external affairs, or, if you please, its trade relations are guided by a central directing head. In the place of the thousands of independent manufacturing units of half a century ago, we now have few industrial giants grappling with each other for the mastery of the trade and commerce of the world. The industrially unfit have gone down in the struggle, and in the form of the corporation or the trust, there has emerged a new business body with a more efficient business brain than the small individual firm of old could hope to have.

The cause of this industrial revolution we have not here time to discuss, nor is it pertinent to the present subject, save that we may say that the same economic and social affairs which have been at work for over a century merging together the great factor systems of the world, are today operating resistlessly toward the merging together of the agricultural industry. Whether we like it or not; whether we believe or disallow that such organization will prove the greatest good to the greatest number, the fact of such industrial organization stares us in the face as the one supreme and insistent problem of farm life.

We are not sure that it would be advisable to adopt any of the successful systems of co-operation that might have enabled the European farmers to stand up in a give-and-take battle with the great land owners; but of one thing we are absolutely certain and that is, that we must work out a feasible system of mutual self help, or our children will find the doors of opportunity closing, and their children will batter in vain at doors already shut.

The abandoned farms of Pennsylvania bear silent testimony that we are not dealing with a theory, but with a condition that should arouse us to prompt and decisive action. The best social life is undoubtedly found in communities of home owners, rather than where the rental, or wage system, of labor obtains. It is evident, therefore, that co-operation is the one solution of the problem facing us. To talk in this day of the dissolution of the trusts is rank folly. You can as readily break down the great business organizations as you can throw back the torrent of Niagara with a spoon.

Somehow, business will organize for the greatest efficiency, will produce at the least possible cost, and you cannot stop the working of that economic law by whistling to the Courts and telling them to make the trusts be good. We realize that before we can secure co-operative effort on a broad scale, that we must immediately overcome some serious drawbacks to the general purpose and plan of the idea. The corporate idea of combination is the idea of force. The small man goes in out of the wet to save his own hide and bank-roll, and he votes his bank-roll against the bigger bank-roll of the other fellow, not as a thing he would do, but as the best thing he can do under the circumstances. Sometimes he stays in the game and sometimes he is frozen out. At all times the largest pocketbook speaks with the voice of authority and a strong point about that system is that the authority is centralized in one, or in a few men, who dominate the business. The weakness of capitalism lies in the selfishness of these dominating factors, and in their tendency to crowd out the small investor, and to take as their own the common property of the many entering the original trust and appropriating to themselves all the profits and savings. To overcome this evil, we recommend that in organizing this co-operative movement, memberships instead of stocks be sold to the co-operators and that the members have but one vote; then man and not money will represent the voting power. We do not lose sight of the fact that farming, like the sister term manufacturing, covers a wide range of separate industries, and that success in co-operative organization will not be attained by wholesale methods of organization seeking to cover the whole field of co-operative effort. Rather should the potato growers, the beef cattle men, the wheat producers, and the horticulturists, organize. There should be separate organizations for each and every distinct line of farm production, and the next problem for our solution, and the one which should engage the attention of this body, is the federation of these various co-operative agents, then to seek a common ground on which to stand and a definition, if you please, of co-operation and that having refined it, we then proceed to work out our definition into practice and into law. We need statutory definition of the term, in order that the legal distinction between the corporate and co-operative institutions may be as definite and clean cut as are their practices. We need not only state laws defining co-operation, but a national law which shall cover the large fields of interstate commerce. We do not believe that the time has yet arrived when we should attempt the more formal union of co-operative societies which time alone, together with experience that shall bring individual and local success, can give. The whole scope of our works, and remember we are speaking in a direct way of the agricultural field, is too disorganized, too strewn with failures, too experimental, for us, either now or in the immediate future, to attempt the final federation of the various agricultural co-operative societies which will naturally come, but which, to be lasting in its benefits, must come through the demands occasioned by local and individual society success. Organization is the beginning and the end of co-operation. Without it, failure is absolutely certain. Our present task, it seems to us, should be to make our local societies, such as the Grange, Farmers' Clubs, the several Unions and allied Agricultural Associations, co-operative; to build up separate organizations into larger units, and to build no faster than business success warrants.

We do not think we shall be able to apply co-operation, at once, to all lines on industry, no in all communities. The human factor must be recognized in every attempt to unite for action. A clear cut recognition of the limitations imposed upon co-operation by the other great forces in the productive, industrial and distributive fields will do much to avert possible failure, and to prevent a feeling of over-confidence, leading us no faster than industrial conditions warrant. We need to maintain a campaign of education that shall not only standardize the product, but shall bring the co-operator into a better understanding of what the business success of the movement means in an economic and social way. We need to break down the idea of competition between co-operative bodies. We need, above all else, to make sentiment and hard business sense go hand in hand. Then, it seems to us, we shall be on the road toward concrete development of the natural order of things.

True co-operation is built upon the principle that "no man liveth to himself alone." This is evident in many lines of work. Farmers build schoolhouses and allow themselves to be taxed. He encourages the law which compels him to give time and money for better roads. All work, such as this, is a application of the principle that we are dependent upon each other. A farmer protects his own household when he protects his neighbors'. He helps his own children when he helps his neighbor raise the standard of the school. When he withholds his support from a co-operative movement, and yet wants its benefits, he is digging a grave for his own rights and profits. The chief aim of this great movement is not personal gain, but one of general welfare. In other words, if the only motive is personal gain and advantage, and that the only one, the co-operative movement cannot be made a beneficial contribution to farm life. It should make its co-operative spirit, its sense of comradship. It is the satisfaction which man gets by working with his fellows that this movement must hold up and draw farmers to gether. If it is to be of any value, it must be trained in the finer spirit of greater human happiness and a closer comradship.

We have dealth with general principles, rather than with specific detail, because thes general facts need working out and that, with some degree of care, before detailed plans of co-operation can be taken up with more than a hope of success. We choose rather, to present the naked truth, than to pluck a bunch of co-operative posies, and pin them to a movement which at this time, and, particularly at this meeting, needs earnest, critical thought. With this aim in view, we offer the following:

Your Committee recommend that a conference be called representing the co-operative associations, and those interested in furthering organizations of this kind, for the purpose of forming a State and National organization, which shall formulate a plan for furthering this movement:

That this conference should include the Grange, the American Society of Equity, Agricultural State Experiment Stations and Agricultural Colleges, the Pennsylvania Horticultural Association and Livestock Breeders' Association, and that this conference shall be called in conjunction with the State Board meeting in January, 1913.

We further recommend the passage of legislation which shall first define what is co-operative business; second, prohibit the use of the term "co-operation" or "co-operative" by business organizations not falling within such legal definition; and third, provide for the proper organization and registration of such co-operative organizations. We further recommend to this body the consideration of the advisability of the appointment of a permanent executive committee, or the continuance of the present committee, to hold office during such time as another general co-operative conference may be held, and to perform such duties as may devolve upon such committee.

Resolved: That it is the sense of this Committee that the term "Co-operation" and "Co-operative" should rightfully be applied only to such organizations as comply with the following regulations:

1. The limiting of votes to individual members, irrespective of holdings, abolishing the proxy.
2. The limiting of interest on membership to prevailing rates of interest.
3. The return of surplus profits, according to the patronage; also, where practicable, according to the service.

(Signed)
R. P. KESTER,
E. P. DORSETT,
ARCHIE BILLINGS.

The CHAIRMAN: We would like to continue this committee for another year. If there is no objection, we will have it so understood that the Committee is to continue for another year.

MR. J. ALDUS HERR: At this time it might be well to make a report of the other Committee.

The CHAIRMAN: Let me inquire, is Mr. Bigelow present at this time? If not, we will take up the report of that Committee.

MR. J. ALDUS HERR: At the last meeting of the State Board of Agriculture there was appointed a Special Committee on Legislation. I have the honor to be chairman of that Committee. At the first session of this meeting we had no report to make, because the members had not gotten together; but since then we considered it not more than right to call a meeting of that committee. Our Secretary will read the report of that meeting.

Dr, Conard, the Secretary of the Special Committee on Legislation read the following report:

REPORT OF THE SPECIAL COMMITTEE ON LEGISLATION

The Committee on Special Legislation appointed by the State Board of Agriculture, has met and beg to make the following report:

That we do most earnestly endorse and urge that prompt and vigilant action be taken by the committee of three, appointed yesterday, in co-operating with like committees from the kindred organizations of the State and agricultural institutions, for the purpose of formulating suggestions and requests to the coming Legislature for funds, and that and suitable apportionment and distribution of said funds may be made to the best interests of agriculture in its many branches. We also solicit for said committee the hearty co-operation of all the agricultural organizations and institutions within the borders of this great Commonwealth.

(Signed)

J. ALDUS HERR,
W. E. PERHAM,
M. E. CONARD,
S. C. GEORGE,
I. A. ESCHBACH.

The CHAIRMAN: What action shall be taken?

PROF. MENGES: I move it be adopted.

This motion was duly seconded and carried in the regular way.

The CHAIRMAN: Once more, has Mr. Bigelow come in? It appears he is not here yet, so we will go on with the regular program.

MR. KESTER: Mr. Chairman, I would like to suggest that if any person have any resolutions to offer that they hand them to Prof. Menges, the Secretary of the Committee as early as possible, so that we may have the report ready when it is called for. When will this report be called for Mr. Chairman?

The CHAIRMAN: At this evening's session. Time will not permit us to wait on Mr. Bigelow, so we will take up the next number of the program, a paper by Prof. Menges on "Co-operation of Farmers."

Prof. Menges read the following paper:

BY-LAWS FOR CO-OPERATIVE ASSOCIATIONS

By FRANKLIN MENGES, Ph. D.

This organization shall be known as the Farmers' Producers and Consumers Co-operative Association.

CENTRAL OFFICE

The principle office of this association shall be at York, York county, Pennsylvania.

OBJECT OF THE ASSOCIATION

The objects of this Association are to unify and promote the interests of its members in agricultural, horticultural, manufacturing and commercial pursuits, including the producing, trading in and dealing in goods, wares, implements, chattels, grains, vegetables, fruits and other general products, and in buying, selling, holding and leasing or improving the lands, tenements or buildings, and for the further purpose of promoting social culture, moral reform and intellectual advancement, and bringing about a direct connection and relation for mutual benefit between the producers of farm, manufactured, mining and other products and the consumers of the same.

CAPITAL STOCK

The capital stock of this association shall be variable. Capital to be paid in is $2,000.00.

MEMBERSHIP

All citizens of the community in which this association is located, or a branch thereof, who are in sympathy with its objects and are willing to co-operate with it in the accomplishment of its purposes, and pay annual dues of one dollar per member and own at least one share, and not more than fifty shares, of full paid stock in the association shall become members and shall enjoy all the benefits, privileges and emoluments it confers, together with the right to cast one vote in person, and not by proxy, in all elections of officers, and for the transaction of all other business of the association.

ASSOCIATE MEMBERS

All citizens of a community in which the association is located, or a branch thereof, not desiring to become regular or stockholding members, but who in all other respects are willing to co-operate with it in the accomplishment of its purposes may upon the payment of an entrance fee of one dollar, and thereafter annually a membership fee of one dollar, become Associate Members and shall enjoy all benefits and privileges of the association, except that they shall pay 2½% more than the stockholding members for all purchases whatsoever made for them through the association and all costs for making sales through the association, and in no wise shall they be eligible to vote or hold office in the association.

OFFICERS

The officers of the association shall be a President, Vice-President, Secretary and Treasurer, and a Board of Directors composed of six members. All officers to be eligible to hold office must be stockholders in the association and shall hold office for one year, or until their successors are duly elected and qualified.

ELECTIONS

The officers of the association shall be elected at the first quarterly meeting of the stockholders in each year, to be held at the Central Office of the association, or at the central office of any branch association, on the third Tuesday of January, at which meeting a majority of the stockholders of the association shall be represented in person and vote in person, as hereinbefore provided, for the election of all officers, and for the transaction of all other business. The other quarterly meetings of the association shall be held on the third Tuesday in April, July and October.

DUTIES OF THE PRESIDENT

The President shall preside at all meetings of the stockholders, and shall call special meeting whenever necessary, or whenever ten per cent of the record stockholders shall request him in a petition duly signed by the required number of stockholders to do so. He shall be ex-officio a member of all committees. He shall sign all vouchers issued by the General Manager, and those authorized by the Board of Directors, and attested by the Secretary of the association, for the payment of all claims of indebtedness incurred in the business transactions of the association. The Vice-President shall preside in the absence of the President and shall in his absence perform the duties of the President as hereinbefore stated.

DUTIES OF THE SECRETARY

He shall be the Secretary of the stockholders and the Board of directors. He shall keep accurate minutes, in books provided for the purpose, of the proceedings of all meetings of the stockholders, as well as the Board of Directors. He shall keep the minutes of both the stockholders and Board of Directors open and accessible for the inspection of all stockholders and associate members. He shall give due notice of all regular and special meetings of stockholders, at least ten days before such meeting, to all stockholders at their record address. He shall after due examination and verification sign all vouchers issued by the General Manager, and the Board of Directors, for the payment of all claims of indebtedness of the association, and perform all other such duties as pertain to his office.

DUTIES OF THE TREASURER

All moneys due the association, whether derived from the sale of stock issued by the association, or from entrance fees, annual dues, or from the sale of all kinds of property whatsoever, real, personal or mixed, made by the Board of Directors or the General Manager of the parent association for it, or its stockholding or association members, or any branch association, its stockholding or associate members, shall be paid into the hands of the Treasurer of the parent association, for which he shall give a legal receipt. All indebtedness of the association, whether dividends on the stock issued by the association, declared by the Board of Directors, or indebtedness incurred in the purchase of all kinds of property whatsoever, real, personal or mixed, made either by the Board of Directors of the General Manager of the parent association for the parent association, its stockholding or associate members, or for a branch association, its stockholding or associate members, shall be paid by the Treasurer upon presentation of proper voucher, except that when such indebtedness is incurred for any branch association, its stockbolding or associate members, before paying any such indebtedness the Treasurer shall be reimbursed by the Treasurer or the members of such branch association. The

Treasurer shall keep an accurate account of the outstanding and unissued stock of the association, as well as all moneys paid him by members in membership fees, annual dues, and that derived from the sales and business transactions of the association. He shall deposit all moneys and valuable effects of the association to the credit of the association in depositories designated by the Directors of the Association. He shall so far as necessary keep a separate account with each individual doing business with the parent association. The books of the Treasurer shall be audited quarterly by a committee of two elected by ballot annually by the stockholders at their January meeting. The Treasurer's books shall be open at all times for the inspection of all stockholding and associate members. The Treasurer shall give bond in such amount as the Board of Directors shall require.

BOARD OF DIRECTORS

The Board of Directors shall meet for organization on the first Tuesday after their election, and shall elect a presiding officer either from among themselves, or they may make the President of the stockholders their presiding officer without a vote in the transaction of their business. A majority of the Directors shall be necessary for a quorum to transact business. They shall elect a business manager, who in co-operation with and by the advice of the Directors shall manage the business of the association. He shall be a man of known practical, honest, successful business experience and ability. All purchases or renting of real estate upon which to erect buildings, or real estate with buildings for storerooms, warehouses and equipments for all other storing purposes, and manufacturing plants and other necessary buildings, and for yardage and railroad sidings and other necessary trackage, shall be made for the association by the Board of Directors, with the advice and co-operation of the President of the stockholders. All real estate, buildings, manufacturing plants, storage plants of all kinds whatsoever, railroad sidings, railroad trackage, and all other railroad equipments, and all other equipments whatsoever shall be under the management and control of the Board of Directors for the association. All sales of real estate, buildings, manufacturing plants, storage plants, railroad sidings, railroad trackage, railroad equipment, and all other equipments whatsoever shall be made for the association by the Board of Directors, and their deed, release or receipt shall be sufficient guarantee to title. All contracts for the erection and furnishing of buildings, and the repairing of the same, shall be made by the Board of Directors, with the consent of the President of the stockholders. A true copy of all agreements of options for the purchase or sale of the property above described, also a copy of all contracts for the erection and equipment of buildings as above specified, and for railroad equipment, shall be sent to all stockholders of record for their inspection at least thirty days before the final purchase of such real estate, buildings or equipment, or the final signing of contracts for erecting and equipping buildings. Should ten per cent. of the record stockholders voting as hereinbefore provided petition the President of the stockholders ten days previous to the final purchasing of real estate or buildings, or the final signing of contracts for erecting and equipping buildings, to call a meeting of the stockholders to approve, modify or reject the action of the Board of Directors he shall do so within ten days after the receipt of such petition. A majority vote of the stockholders present who shall represent at least 66⅔ per cent. of the votable stock of the association shall be necessary to approve, modify or reject the action of the Board of Directors, in which mostly the Board of Directors shall not vote, neither shall their stock be represented. All dividends, not to exceed five per cent., on the stock issued by the association shall be declared by the Board of Directors. The salaries of all officers and employees of the association shall be fixed by the Board of Directors, except their own which shall be a per diem and shall be fixed by the stockholders at their January meeting, voting as hereinbefore provided. All salaries of officers and the per diem of the Directors shall not exceed five per cent. of the total financial business transactions of the association, exclusive of the purchase of sale of real estate, buildings, etc., their construction and repair. The stockholders if not satisfied with the salaries as fixed by the Board of Directors may at an annual meeting by a majority vote, voting as hereinbefore provided, increase or decrease the salaries of any or all officers of the association. Any stockholding member of this association who is directly or indirectly acting as agent or representative of a manufacturing, jobbing, wholesaling and retailing concern, or any combination whatsoever of these, shall not be eligible as members of the Board of Directors.

GENERAL MANAGER

All orders for purchases of machinery of all types whatsoever, of fertilizing materials and mixed fertilizers, seeds of all varieties, farm products of all kinds, animals of all species, raw and manufactured materials, fuel of all kinds, building materials of all kinds, tiling, merchandise of all kinds whatsoever, made by the stockholding or associate members of the parent, or any branch association, shall be filled by the General Manager. The General Manager shall sell to the best advantage for the stockholding and associate members of the parent or any branch association all farm and manufactured products of all kinds whatsoever, raw materials of all kinds, animals of all species, and animal products of all kinds, whenever requested to do so. He shall give invoices of all shipments to all branch association made to them or their members. He shall give a receipt and invoice giving the names, quantities, quality and condition of the products to the one furnishing these and retain a copy for himself, and send a copy to the Secretary of the association. He shall keep in touch with all reliable consuming agencies, especially consumers co-operative associations, for selling what is offered, and with manufacturers and producers for buying what is desired, and shall keep in his office catalogues and price lists on file for the use of the members. All orders filled by him for stockholding and associate members, or branch associations, their stockholding or associate members, shall be paid in cash or its equivalent. The sales made by the General Manager for stockholding and associate members of the parent or any branch association shall be paid within five days after the Treasurer has received the money for the same. The expenses incurred in making these sales shall be deducted before such payment is made. The General Manager shall make all bills payable to the Treasurer, and all vouchers by the Treasurer. The General Manager's records of purchases and sales made for stockholding and associate members shall be open for inspection to all such members.

BRANCH ASSOCIATIONS

Ten or more stockholding members in the parent association, or ten or more individuals who are not stockholders in the parent association, but are willing to co-operate with it in the accomplishment of its purposes, who live within reach of a business or shipping point, who won ton or more full paid shares of stock at $10.00 per share in a local association shall, if their constitution or by-laws do not conflict with these by-laws, be recognized as a branch of the parent association. Each branch association shall be financially responsible for its equipment and for whatever property, real, personal or mixed, that may be necessary for conducting its business. The stockholding and associate members of branch associations shall not assist in any way in paying dividends on the stock of the parent association. All orders drawn on the General Manager for purchases or products as enumerated under "Duties of the General Manager" desired by branch associations, their stockholding and associate members shall be filled by him. All such purchases together with the expenses incurred by the General Manager in the procuring of the same shall be paid in cash or it equivalent, and in no wise shall the parent association be financially responsible for such payments until reimbursed by the branch association or its members. The members of the Board of Directors of all branch associations who are not stockholders in the parent association shall have one vote each in the election of all officers in the parent association, but not in the transaction of any other business. Copies of invoices stating the quantity, quality and conditions of all shipments whatsoever made by any branch association to be sold by the General Manager of the parent association shall be furnished by such branch association for the General Manager and the Secretary of the parent association. Any offers of a higher price or prices for any of the products whatsoever of the quality sold through the General Manager of the parent association and enumerated under his duties, and a lower price of the same quality for those purchased through him and also enumerated under his duties, made by any consuming or producing agency, or any combination of these whatsoever, to any member or members of the parent association, or any branch association, member or members thereof, may be accepted by either or all of them but such purchasing or selling prices shall be at once communicated to the General Manager of the parent association and shall become available for the parent association, its stockholding and associate members, and all branch associations, their stockholding and associate members. The refusal or neglect of any stockholding or associate member in the parent association, or any branch association, its stockholding and associate members, to make such communication to the General Manager of the parent association shall be deemed sufficient reason for the Board of Directors of the parent association to withdraw the priviledge of buying or selling through it by any such member or members, or branch association or associations. This provision shall not be construed to include purchases or sale that may be made locally.

STOCK

The par value of the stock of this association shall be ten dollars a share. All certificates of stock shall be signed by the President and Secretary of the association. The money derived from the sale of stock of the association shall be used for the purchase of real estate, buildings and necessary equipment, and in the case of the association desiring to keep the products enumerated on hand for the benefit of members may by and under the management of the Board of Director use the money derived from the sale of such stock for such purchase.

UNASSOCIATES

All people desiring to buy or sell through the association who are neither stockholding or associate members in the parent or any branch association shall be allowed such discount on purchases and rates for selling as the Board of Directors may determine.

EXPENSES

To all purchases made by the General Manager for the parent association, its stockholdings and associate members, or a branch association, its stockholding and associate members, shall be added all necessary expenses incurred in the procuring of such purchases, and such dividends up to five per cent, as the Board of Directors may declare. With this addition the stockholding members shall receive all purchases at cost, while to all purchases made for associate members two and on-half per cent. shall be added, which may be used if they so desire to purchase stock in the parent association or a branch thereof.

THE TERM OF EXISTENCE OF THIS ASSOCIATION IS THIRTY YEARS

These by-laws may be changed or amended by a majority vote of the stockholders at a regular or special meeting, provided that a notice of the proposed change or amendment shall have been sent by the Secretary to each stockholder of record at least sixty days previous to such meeting.

NAMES OF FIRST MEMBERS AND THE NUMBER OF SHARES OF STOCK

PROF. MENGES: We have a good co-operative law in this State, signed by Gov. Beaver in 1887. It is a little different from the laws of the other states.

The CHAIRMAN: Any remarks relative to this paper?

MR. DORSETT: Do you intend to limit the number of shares?

PROF. MENGES: Yes, sir.

MR. DORSETT: How many?

PROF. MENGES: Fifty.

MR. DORSETT: How many votes?

PROF. MENGES: One vote.

MR. DORSETT: It is seldom we have a law in Pennsylvania that is well spoken of. Does that limit the amount of stock?

PROF. MENGES: Yes, sir; you can only have a thousand dollars' worth of stock in an association; we have limited it to five hundred.

MR. DORSETT: But do you know that under the laws of Pennsylvania, you can have as many votes as you have shares; I don't believe your by-laws will stand the test.

PROF. MENGES: Well, I don't know; I submitted these by-laws to a man who stands very high in office, and he said they would go through. It is under the law of 1887, you know.

A Member: What is the value per share?

PROF. MENGES: Ten dollars.

MR. DORSETT: Well, I am not questioning it, Professor, but I have been informed that a man is entitled to a vote for every share of stock he gets.

PROF. MENGES: Well, that may be; but I believe it depends upon the law under which you incorporate. We were incorporated under the law of 1887, signed by Governor Beaver, and unless that law is unconstitutional, I think our by-laws will stand.

MR. DORSETT: I think it has been decided by the courts that a man is entitled to a vote for every share of stock he owns.

A Member: I know that under the common law of the State a man is entitled to a vote for every share of stock in any corporation, or he can vote cumulativly.

MR. KILLAM: Under the law 1874 you can vote directly, or by proxy, for each share of stock you hold. The law of 1887 is another Act, and I do not know of its having been declared unconstitutional, but the question having been raised, I would say that a man can vote as many shares of stock as he can get a proxy for.

PROF. MENGES: Well, sir, we looked into this thing very carefully, and I consulted a man who stands high enough in office to know. I don't want to consume any time. Mr. Bigelow is here; but I just want to bring a few suggestions before this audience:

You all know just as well as I do that unless the Co-operative Association can buy at rock bottom prices, just the same as other selling agencies are buying—unless we are strong enough to do this, co-operation is doomed. You might just as well make up your minds to that. Now, I have had a little experience. Some time ago I wrote to Washington for the names of the importers of German Potash Salt, but I couldn't get them. But I happened to belong to an organization through which I knew I could get them; it is no secret society; it is the American Chemical Society; I got from them exactly what I wanted. Now, the people of Lancaster and York counties have had a meeting, and reached this agreement. We represent between fourteen and sixteen hundred farmers. Now, we are all farmers, and we are united in our belief that we should not only be able to buy as cheap as anybody else, but we should buy at rock bottom prices. Now, my friends, I suppose I had better keep my mouth shut, but unless we can get the original package right from the ocean steamer, like the other fellow does, we are doomed again right there.

Now, you know that the self-binder costs approximately fifty dollars to make. I am not condemning the middleman; he is not the centre-wheel; he is only a cog in the system that gets everything that you and I pay over fifty dollars for that self-binder.

MR. FENSTERMAKER: Who gets the difference?

PROF. MENGES: I said I am attacking the system.

Now, Mr. Fenstermaker, you draw your own conclusion. Now, my friends, I want you to tell me if that is good co-operation sales agency that saves the farmer this fifty or seventy-five dollars? If you think so, and you can find such an agency, go into it, and I'll tell you another thing: you should go into it. The salvation of the agricultural interests depends upon it. The commercial system that stands between the producer and the ultimate consumer costs us entirely too much.

Now, we want to find out exactly what the selling agency gets. Well, I'll tell you; in the case of this fifty dollars that I am talking of, he gets exactly two dollars. The fellow who wants a Gearing or a McCormick self-binder is going to pay two dollars extra if he wants it. So far co-operation has done away with the local fellow, but he is the fellow that we need. Outside of that it has not done anything; it is the fellow who does not live in our community that gets by far the largest part of the farmers' fifty or seventy-five dollars, and he is the fellow we must get after. I would like to get the system, not the middleman who makes his few dollars and lives in our community, I would like to get every man and woman in this institute into the co-operative movement. But you take a fellow who wants the McCormick binder, and offer him something just as good, he will pay the forty dollars difference and take the McCormick every time; but it is the fellow in the rut, to whom you can offer some inducement; that is the first thing. I sometimes get a little bit mad at some of the things that are said at Farmers' Institutes and at Normal Institutes about the old farmer back on the farm, because that was where I was raised. I remember from 1880 to 1896, my old father who owned a farm of 130 acres, and had six children whom he tried hard to educate, but wheat was fifty cents a bushel—some of you older men remember that; he was a cattle feeder and realized from six to eight hundred dollars from that; but from that time on until 1903, when he died, and from that day down to this, it is a question whether the other fellow will allow you a margin on your cattle or not. I remember when my old father came into the house, and with tears in his eyes, said, "I want to educate you boys, but, I can't afford it; you will have to do it yourselves." That is what this system has cost me—an education, and the making of better things out there on the farm. I don't know whether you like this or not, but I believe it just as sincerely as that I am standing before you. Now, can you and I afford to sacrifice the education of our children to the commercial system. That is the question that is before us today. I tell you, you put more money out there on that old farm, and the rest will take care of itself. How is that Mr. Northup? I said the rest will come. You won't have any of that "little old red school house," because people are beginning to look for better things. Now, gentlemen, you know co-operation is the thing. It is one of the possibilities of salvation for the farmer.

DIRECTOR MARTIN: Has Mr. Bigelow, the Road Commissioner, come in? Since he is not present, we will now have a very short period of time to devote to the discussion of some questions relative to the Farmers' Institute work. I notice before me some of the old wheel horses of Farmers' Institute work, men who fifteen years ago and twenty years ago, had their sleeves rolled up, going up and down through the State in this great work for the farmer. We have men who have grown old and gray in the work; and the first man I would like to listen to for a few minutes—longer if we had time—is Mr. Henry Northup of Lackawanna county.

Mr. Northup spoke as follows:

ADDRESS BY HENRY W. NORTHUP

Mr. Chairman, Ladies and Gentlemen: I think I can offer a few remarks to the Farmers' Institute. In the first place, I am acquainted with a man that I think should be discharged for the benefit of the Farmers' Institute. His usefulness is about ended; he has been in the work for about twenty years. That seems a long time, and I know it is a long time. I have been under the Director of Institutes for thirteen years, and I don't feel a bit older today than I did when I went into the work. I have had a good time, and enjoyed it. I was at a Farmers' Institute down in Ulster, and I enjoyed it, but I got into conversation with a farmer who said to me, "aren't you a little old to be connected with the Farmers' Institute?" I said, "Perhaps I am, but I enjoy it." We need active, live men in this work, and for that reason I think I had better step out and make room for a younger man who can do more to improve the Farmers' Institute than I can. I think I had better say this myself than let you say it, because I know you want to. I think I will enjoy it more. Another thing I want to say is, I think I had better quit when I should do so.

I have talked in fifty counties of Pennsylvania, and I have learned as much about it as the people have, anyhow. I have at least learned how to conduct my own business on my own farm.

I think it would be an improvement to the Farmers' Institute to have it open by men that are prompt. You know the Institute lecturer is expected to be there, and he is there, but often the public is not there. They are waiting for the meeting to warm up, and then come in and enjoy it. Now, why not have this thing started right at the beginning of the Farmers' Institute? It will only take a little work on the part of the County Chairman and his committee of workers. There is a man sitting right here in this meeting who does this, and his first audience is as good as any he has. Now, how does he do it? Simply by getting there himself, and his workers get there, and he starts promptly and keeps things going. Then he got the people interested beforehand, and got them to come out by a little personal work on the part of himself and his workers, and we had a splendid meeting. He left his work to go out and work for the Farmers' Institute, and he made a success of it. No one can make a success without making some sacrifice for it. I can emphasize that point, because I had the management of the Institute work in Lackawanna county for ten years. The Chairman must go out among the farmers and talk up the Institute and urge them to come to the first meeting and get it started up, and when the lecturer gets there at nine o'clock and looks at the audience assembled there, he knows whether it is going to be a success, or not. Every Institute lecturer knows the value of being prompt. When I was a lad and went to school, the boy who was prompt got the best marks and was counted the best scholar. It is the same with the Farmers' Institute.

Now another matter that I think can be improved at the Farmers' Institute: You want to discuss such topics as the farmers of that community are interested in. Suppose you take something they don't care anything about; you won't have a very successful institute, but if you take something that the people want, you will have a successful institute every time. Into one community it is better to send a dairy-man out; another community may want potatoes, and a third, soil and fertilizers; but whatever it is, let the Chairman of the county correspond with the Director of Institutes, and have him send men who can talk on the subjects that interest that particular community. I don't believe there is a man in Pennsylvania who gets as close to all classes of people as the Director of Institutes does. I know of one county where they wanted soil fertilizer, and I was sent out to talk dairying; but I talked soil and fertilizer. The trouble is that too many farmers are like the man who was very close, but had a big farm. He went to church regularly and heard the preacher talk about the power of prayer; so he asked the preacher to come over with him and pray that the Lord would give him a good return from a field that was very poor; the preacher prayed, and then he took him into another field, which was poorer than the first one they had been in; the preacher looked at it, and said, "there has got to be something done besides praying, here; there has got to be some manure."

DIRECTOR MARTIN: Now, my friends, this meeting is open for questions, if you have such, relative to this Institute work. Please present them promptly. Our time is brief, so make your discussions short and to the point.

MRS. FOULKE: I should like to bring up the question of our evening sessions. I don't know how we are going to get away from what is called our "evening audience,"—the people who come for amusement, rather than instruction. We go out as instructors; we don't go out as entertainers or minstrels, but the evening sessions almost put us in that position in a great many cases. The evening meetings are largely given over to local talent—the boy or girl who can recite, or whistle or sing, or play the piano or violin, and the question of instruction becomes a very secondary one, indeed. I have no doubt you sometimes think I'm a fool, but I am not a fool, and I do not think I am called upon to get up and amuse people. These evening entertainments are all right in their place, but I do not think we should take the State's money for it.

Then there is another thing: I do not think we should talk so much about ourselves, our own personal experiences, unless we have something to back up our assertions. I have heard men talk about following the plow, who know nothing about it. With all the experiments conducted by the State College and Experiment Station to talk about, experiments that have been conducted for thirty years, and shown results, why need we talk our own little two-pence half penny experiences? Let us give them facts, and leave ourselves out of it altogether. We are there to teach, not to talk about ourselves, or tell funny stories, as I have heard too many of our lecturers do.

Then another thing I want to talk about: I think there should be little bit more unselfishness on the part of some of our speakers. You will find some speakers who are scheduled to talk for twenty-five or thirty minutes, take an hour or more, and infringe on the time of the next speaker, in some cases taking all the time allotted to him or her This is wrong. Because you are interested in chickens, or some other particular thing, it is not fair to assume that the entire audience is, and it is encroaching on their time, as well as on the time of the next speaker. Now, if I am scheduled for twenty-five or thirty minutes' time, I am going to get that time, and I believe every woman on the force feels as I do. If we don't do good work, we should not be on the force, and if we do good work, we are entitled to our share of the time when we go to a meeting for the purpose of instructing the audience.

Another thing is the separate meetings for men and women. I am not in favor of it. The woman should know all that is going on about the farm, and the man should know just as much about the kitchen sink and the bringing of the water into the house as she does. I never want to talk to a 'Ladies' Session': I want to talk to a 'Women's Session", and at that session to talk to men and women every time.

MISS BURNITE: I want to emphasize everything Mrs. Foulke has said, and more. My experience has been that when I get the women by themselves in a separate session, I cannot reach them as I do in the open session; and there were places last winter where it was absolutely impossible to hold a separate session. I have been at meetings where the men were more interested than the women. In New Wilmington last winter I had to hold a separate meeting for the women, and I found the men more interested in it than the women were.

Then, in reference to the evening session: I was given last winter, time and time again, twenty minutes at an evening session to discuss Home economics, and they had no time to listen to me because the entire evening was devoted to local talent. Home Economics and Hygiene and Sanitation in the home are too important to be crowded out by amusement.

DIRECTOR MARTIN: I want to say a word just at this particular time. Sometimes necessity is a great primary force, and necessity has compelled me to say that at the next sessions' institutes there will be just three instructors. In going over my list of opportionments for the different counties, I found I had expended this last year by $5,000 more then half of the two years' appropriation. I found further that by allowing just three persons to each meeting—I could keep within my appropriation. So I want to say to the County Chairmen, " Go back and consult with your people, and find out what kind of instruction your people want, and then write to me, and we will make up a list of the people who can talk on these subjects; don't ask for another instructor along these lines, because it will be impossible to grant your request."

A number of good instructors will no doubt be disappointed and I am sorry to cause you any disappointment; it is only necessity that compels the action.

We have been given some good points this afternoon on the matter of promptness, and the manner of the speakers, as well as the chairmen have come in for their share. I hope we will be able to profit by what we have heard.

MRS. FOULKE: Mrs. Smith has asked me to say for her that if the meetings were more widely advertised by means of posters, she believes it would help to bring out a better audience.

MR. J. ALDUS HERR: I would like to say a word about the County Chairman. We get out the programs as well as we can, after consulting with our committees. It is usually pretty full, and then some speaker comes along and talks forty minutes longer than he is on the program for, and the next speaker doesn't get an opportunity to talk at all. I have had just such experiences, and the audience often goes away dissatisfied because they came to hear a certain speaker who is crowded out.

PROF. MENGES: I don't think you have said everything there is to be said, but what you have said is the truth.

MR. JOEL A. HERR: Mr. Chairman, I have a little experience along this line. I believe I have always tried to treat the ladies as courteously as I know how—

PROF. MENGES: That is true.

MR. JOEL A. HERR: Many speeches when they are half an hour long are long enough, but when they are lengthened to an hour they are too long. Many of our ladies have subjects that are entertaining for the evening, but there is not much in them and nothing has been learned when they get through. I am not saying this as any reflection upon the ladies, but what we want is the kind instruction that will make us better housekeepers and better farmers when we get home. We don't want something that will fill up the time, and be forgotten when we get home. Now, the speakers should be selected in time, and know just what they are going to do, and then do it.

So far as the programs are concerned, they should be printed on a little better paper; the paper is so flimsy that it is practically worn out by the time it reaches us; and there should be room for the addition of two or three names. The spaces left now are so small that it is almost impossible to write the names in legibly.

Now about amusement: Some people had better never try to tell a story, because they can't do it. Other people are able to emphasize their teachings by means of a story. Now I don't believe in the story being given first place; what we want is instruction; but if a point can be brought by means of a story, it is all right.

Now as to the speakers. I am glad they are reduced to three. Why, at one institute last winter we had six, and it wasn't our fault, either.

MR. JOEL A. HERR: I would like to criticise another thing. Brother Kahler and I had some little trouble over it. Some times we arrange to take care of the speakers. and they refuse to go to the places assigned them, and go off to a hotel ten or twelve miles away now, what is to be gained by going to a hotel, ten or twelve miles away after the people have arranged to take care of them and have gone to a great deal of trouble? Take one case last winter; the people had gone to a great deal of trouble, and put up stoves in the bedrooms and done everything they knew to make the speakers comfortable, and then the speakers refused to stay but went on to town some miles farther on, to a hotel. These people got the impression that their entertainment was not good enough and they took offense.

DR. CONARD: Just a few words in regard to the story. Personally, I never tell one because I can't. Sometimes it may be all right to tell it simply as a clincher. simply to make your instructions take hold, but some of the stories I have heard some institute speakers tell cannot be too strongly condemned, because I have heard some told that are a disgrace to any institute speaker.

I am glad Director Martin is going to reduce the number of speakers to an institute. I have been at meetings where there were five speakers. who discussed five different subjects—dairymen, poultryman. fertility men. orchardist. and a lady on Home Economics—five distinct and different topics to be discussed and in less than thirty minutes. Now in the last thirty years I have had a great deal of experience in both the institute and the school work.The school has only about two instructors; it has been my privilege to be connected with the dairy end of the school; now we have short talks. and very thorough discussions, and I feel that we can do better work where we don't have to divert the attention of the audience from dairying to poultry or to orcharding. or to something else. I believe we can do more good by taking one or two subjects and discussing them thoroughly than by switching from one subject to another in a short time. The subject is largely a matter of locality. and if the county chairman will give the Director a list of the topics that interest the people of that particular community, he can send the speakers to talk on just those particular topics. and have them thoroughly discussed. The way things have been, we have to leave with the work half done.

Now. as to going away to stay over night. there have been cases where it has been necessary. You must remember that the institute speaker is away from home all the time, and he gets the best he can to take the place of home, and he has to get something pretty good to be compensated for it. He has been at the command of the audience all day, and if he goes home with them at night, he is likely to be talked to death. They want to sit up late and talk about the subjects that interest them, forgetting that the institute speaker has had day after day of this same kind of work, and is tired out when night comes. I have known the time when I wanted to get just as far away as I could, where I would not be worked to death, and have a few hours to myself. I have seen the time when I have been worked until midnight. I believe that with fewer speakers, properly placed, we can do better work; if two men are assigned to a place, and another man so changed as to meet emergencies, I believe we can do better work than with a larger force.

MR. BARNES: As Chairman of one of the counties in which we hold very successful institutes, I wish to say that I have had trouble in years gone by with speakers who would not stick to their subject, or who would not talk on the subjects as assigned in the bulletin for them; this trouble was with ladies, particularly; one lady, especially, would never speak on the subject for which she was assigned. She had a troublesome temper, and often undertook to tell the women in the audience how they should conduct their household affairs; she carried this to such an extreme that she often offended her audience, and on one occasion, a woman in the audience got up and said to her: "Will you kindly tell us how many children you have?" She said, "I never had a child in my life." This lady is not on the force.

I just want to say a word about advertising the meetings. I believe in keeping in touch with the newspapers from the time the list is made out in June until the meetings are held, and keeping them before the public; when our meetings are held, we often carry with us two reporters from our county town, and we always have good meetings when the weather conditions permit it. Secretary Critchfield says these are some of the best meetings he ever attended. He was at one where we had over five hundred people present. It was simply a little county fair, and we distributed over two hundred dollars in premiums. To make the institutes successful, the support of the people back of the chairman is essential; and I have never had any trouble in getting this support.

MISS THOMAS: Notwithstanding what has been said in favor of the County Chairman, I am inclined to think that there is a good deal of responsibility resting on the county chairman and the committee. I think the program should be made out with reference to the benefits the people of that particular locality will get, and the speakers selected with reference to the subjects that appeal most to them.

Then I must endorse very largely that Mrs. Foulke has said, because I have felt just exactly as she has. I have felt that the institute work has been very decidedly hurt by the tendency toward amusement, and I think she voiced the feeling of the people very largely that they are not willing to pay for the institute workers unless they give the instruction for which they are paid, and if you give that instruction you can't do very much toward entertaining the audience.

I agree heartily with what Mr. Herr has said, and I hope the women of this force will do all that is possible for them to do toward elevating the women on the farm. I feel that we do not, at this present time, want too much scientific knowledge. This scientific knowledge should be brought to the farm in a very practical way, because they are not sufficiently interested in it to take it up unless it is very practically adapted for them. I think there is a very great field in this direction.

Now, I should like to say just a word in reference to our workers. I am very painfully aware of the inefficiency on the part of some of our workers, and I am likewise aware of the great missionary work that some our instructors are doing these latter deserve our heartiest sympathy and co-operation and when they leave a community, I think the people of that community should feel themselves under a debt of gratitude to them.

MR. KESTER: Last fall, I think it was, I read an article on the work of the Ohio institutes, and it was to the effect that the time was too much taken up by the institute workers themselves, and there was no time left for discussion. Now I think it might be well for the institute speakers to take thirty minutes for his talk, and then allow twenty minutes for discussion of the subject. I consider that institute a failure where the speaker cannot arouse any discussion. The institute that counts for something is the one in which the greatest interest is manifested in the discussion. It don't care how eloquent the speaker may be, or how full of interest his talk is, I have seen people in the audience go to sleep over it unless they can be induced to fire question at him and take some personal part in that institute. Then stop when your time is up; but be sure you arouse interest enough to get up a lively discussion, or your institute will be a failure.

MR. BIDDLE: I would like to offer one suggestion. I know that a good deal of the blame rests upon the Chairman and the local committee, but I believe that the Chairman should take good, live man in each community where the institute is to be held, and have him take it up with the farmers in that locality, because he can get into personal touch with them, and it is the personal work that counts. Then make up your program with reference to the subjects that interest those people, and in having my programs printed, I always put a few questions on it, just as a guide to set them thinking and open the way for discussion. Last year was my first year as a County Chairman, but it worked very well with me.

MR. PEACHEY: I am perfectly aware that our time is limited, and it is hard to choose between the praise and the criticism we have received this afternoon. Now, I don't tell stories unless I want to, but I don't feel that I have lost any time when I see my audience getting sleepy and I tell them a story to keep them awake.

Now, as to the three men, I have advocated that for years, for the benefit of the speaker and the audience. I have advocated it publicly and privately.

A Member: How many women?

MR. PEACHEY: We need the women on the force; I don't like to conduct an institute without women, and I don't blame my lady friends over here if they don't want to talk where there are nothing but women. They put up with their share of the hardships. Last winter I went with some of the institute ladies to hold a meeting; when we got there, there was no County Chairman in sight, and we went through the town looking for a place to stay. We finally found the hotel to which we had been assigned, and it was hardly a fit place for the ladies to go to. I spoke to the County Chairman about it, and he said, "Well, you can hardly expect to get to a good hotel every day; they get paid for their work." That hotel was as cold as charity. We stayed there on Saturday night because there was nothing else to do, but on Sunday we drove nineteen miles. We went more than a Sabbath day's journey, and I don't know how much we worshipped on the trip. I think that the liveryman didn't worship at all. It was cold, and we nearly froze, but we finly reached our destination, and had a warm room.

What I want to say is, that we should try to get the County Chairman to look at the things from the lecturers' point of view, and the lecturer should try to get the County Chairman's point of view; then things would adjust themselves. I will say this: We have some County Chairmen who are a little too liberal in commenting favorably or unfavorably on the speeches of the men before them, and the speeches of these men failed in their effect. I want to say, though, for my friend Mr. Biddle, that most of our chairmen could get good points by going down to Bedford county. Sometimes things are gotten down to nothing whittled down to a point and then the point broke off, but Mr. Biddle knows how to conduct an institute.

Then I will tell you another thing: The section leader does not have the authority he should have. When the institute managers stand by him—

DIRECTOR MARTIN: Tell us what authority you don't have.

MR. PEACHEY: At a convention of rats, who were watched by a cat, they passed resolutions, and did various other things without results; then one very wise old rat said "Let's put a bell on the cat."

DIRECTOR MARTIN: I want to interrogate you for a moment: When you are sent out with a section, are you not given the very same authority as though I was there myself?

MR. PEACHEY: In certain cases; but you know you don't want to guarantee too much protection. You run up against a County Chairman sometimes.

DIRECTOR MARTIN: I put you there to act as though I was there myself; wherein do you need protection?

MR. PEACHEY: I say it is a difficult matter. You come to a County Chairman and say to him, "It is time for the meeting to begin," and he says, "Yes, but I want to see this fellow and that fellow," and how are you going to get that meeting to order?

DIRECTOR MARTIN: We are getting down to real hard business now. I have always told you leaders of sections that where the County Chairman does not come up to time to take charge of that meeting yourselves. Have I not done that?

MR. KESTER: Yes.

MR. PEACHEY: I have done these things: I have called the meeting to order, but I do say that the man who has charge of a section should have a little more authority; he should have authority to cut out some of the local talent at times. I mean by that help that was brought in for a purpose. I can enumerate instances in Pennsylvania where people were brought in who had to be patted on the back for some reason or other, and the meeting was one long speech of advertisement. I am willing to have local talent, and there are instances where a section leader is glad to have local talent to fall back on; it is an advantage to our institute force. I know of one instance where one of the local talent talked for three quarters of an hour, and I guess he would be talking yet unless I had gone to the County Chairman and insisted that the speech must be stopped. I can tell you the name of the man, the County Chairman and the county. We are getting to the point where we are given the responsibility without the authority to carry it out.

MR. CARD: This discussion has brought out some of the unfortunnate things in institute work. Some of these thinks, we must recognize, can be helped, and some cannot be helped. First of all, take the matter of being crowded out, which has evidently hurt so badly our lady friends. That is one of the things that can be easily remedied. Take one man who is allowed forty-five minutes for his speech, while the next subject is crowded into fifteen. These things should not be, but they are, and they should be remedied. Then the matter of starting in promptly. Often the meeting is called for nine, and doesn't begin until eleven o'clock. The local man may not be there, and yet, I think, we will all agree that local talent is an advantage to an institute. I remember one instance, though, where the local man was to talk ten minutes, and he talked forty-five.

The matter of provision for the speakers was spoken of. I imagine that some of us, perhaps, are getting a little too notional, but there is sometimes cause for complaint. I think Mrs. Foulke will remember one case last winter, where we went into a town; there evidently had been little provision made for our entertainment; but we finally found the hotel to which we had been assigned; we found it hardly a place where a lady could stay, so we left our luggage and went out and found another place. Some of the hotels we find in going up and down the State are well managed; some are not. In one place I was assigned to a hotel where I had spent a night before, and in that night I disposed of twenty-two other inhabitants of the room who had possession before I came there, so I would not stay the second time. But all these things must be expected.

One speaker referred to the necessity of bringing out a discussion. That is sometimes a very hard thing to do. It depends largely upon the community. I have been at places where we could not draw out one single question; and again I have been at others where we got up a very lively discussion. It all depends upon your audience, or your ability to impress them, perhaps.

Now, so far as the matter of the reduction in the force is concerned, three persons are enough. I think that better work can be done with smaller number.

The matter of entertainment: It is a question, often, to choose between the matter of entertainment and instruction at an evening session. Often after the speaker has done his best to instruct the audience, in going home he will hear some one say, "Well, I didn't get much out of what that fellow said," while the entertainer gets the praise, so it sometimes becomes a question as to which is best,—how far the meeting shall be made entertainment, or strictly a matter of instruction.

MR. RICH: I believe we are getting to the point where to have a correct report of the speakers' speech, it is necessary to have a syllabus to hand to the paper; there are so many points touched on that a man's speech necessarily is long sometimes, and it is well to have the principal points covered so that a glance will tell what they are.

PROF. MENGES: There is one subject that was discussed last winter by a Committee that met at State College, and that is the advertising of the Farmers' Institute in the local papers. You know just as well as I do, that in order to get the people interested, it is necessary to get the meeting advertised. Mr. Barnes referred to it.

I have made an effort along that line in my own section. I was in my own section last week, and I again took up the matter with the people; they are not here today except Mr. Barnes. I know this: That a wide-awake newspaper in any county will be glad to get reports of the institutes, and publish them all. I have never had one bit of trouble in getting anything, so far as agriculture was concerned, in any of our papers at York. They come after me when I don't want them. Now, how many of our County Chairmen have made any effort to advertise the institutes in their counties? I got into a county last winter, where the papers knew absolutely nothing about there being an institute. That is not the business of the Department; it is the business of the local chairman. And nothing will bring out the people more than that kind of advertising. It is easy to advertise, because the majority of papers will gladly take it, and if you find a paper in your county that is unwilling to publish, cut that paper out. If you stand up for your rights, you will soon get it. I was in a county last winter, where the County Chairman was oblged to pay a dollar for advertising this meeting; he paid it, but I made it my business to go on the platform and ventilate that paper. I don't know, Mr. Martin, whether I had authority to do that, or not, but I did it.

DIRECTOR MARTIN:-You have the authority, but you are entirely responsible for it.

PROF. MENGES: Mr. Peachey referred to a meeting last winter where the local talent consumed the time of the instructors. At one meeting where I was, we had a speaker who was put on the program to talk about fifteen minutes, and talked thirty. I thought fifteen minutes was long enough, and I said "Mr. Chairman, this is not a chestnut tree; it is a Farmers' Institute.

MR. BARNITZ: Do you think the newspapers should expect us to hand over a long report of our institutes?

PROF. MENGES: No; I think we should talk to a reporter, and get the reporter to come to that institute.

MR. BARNITZ: You told us last winter that our speeches would be published; that there would be a reporter there to take them down; after the meeting he came to me and said "Where is your speech?" I told him I had none; he then told me to give him a report of it, and he would take it down. Now, we fellows are kept busy writing to our wives, and it is hardly required of us to write our speeches for the reporters.

PROF. MENGES: Let me explain what happened. These reports went to the Secretary of our paper, and they were not published. It took a long time to get anything from you. And there is another thing I want to say; I tell stories myself but they are the right kind. I was at a place last winter where they began "knocking" the institute speakers, and I made up my mind that if there was any "knocking" out to be done, there would have to be some pretty hard "knocking."

I don't believe I can be accused of cowardice, and I talked pretty plain to those people, and in order to clinch it, I told a story. I want to tell you that sometimes a story has its effect. The one I told had, I think. It referred to Lincoln. Nearly all the members of his cabinet had been candidates for the presidency at the same time he was—Cameron, Chase, Seward, Wells, and I forgot the other fellow's name; and when they were chosen as his cabinet, they began to think they were the President; his friends urged him to discharge them, but he told them a story: He said, "I knew a farmer out in Illinois who was troubled with skunks; his wife begged him to kill them; they came around at night, and they bothered her. So he took his old rifle and went out to watch the skunk. By and by the skunk came and he blazed away, and pretty soon he came into the house; his wife asked, "did you get the skunk?" He said, "Instead of one skunk their were seven and if the one I got can raise such terrible smell, I think I had better let the others go.

MRS. FOULKE: Just a moment; I want to correct myself. I am glad to have brought out this discussion, which is what I want done But when I referred to the first speaker crowding out the one who was following him, I was not talking for myself, nor, in fact, for any one in particular; but I have sat on the platform with Mr. Card, when he was not given a chance to speak, and I have know other cases. It is true I have been crowded out myself several times, but it was by the local people who were not called down. I know the same thing has also happened to Mr. McCurdy, and there are others who can talk for themselves. So far as story telling is concerned, if you are a good story-teller, and tell the right kind of a story and tell it for a purpose, it is all right, but I have heard stories that should not have been allowed on the platform.

MR. NAGINEY: I should like to say a word about the County Chairman and printed matter in the county newspaper. I have made an effort to advertise the meetings in our county in this way. I went to one paper and the editor told me they were not living on charity; that "the man who buys your produce might be able to do something for you." Now, how are you going to go about it?

PROF. MENGES: Ventilate such papers thoroughly.

A Member: The women of our county printed the program in the local news for weeks and weeks ahead, and the papers are glad to get it.

MR. NAGINEY: When I had the programs printed, they were glad to get the work; when I went to one fellow, the other man thought he should have some of the work, too. Now, how do you remedy that?

MR. STOUT: I am one of the back numbers, who should have been Oslerized before now, but there is one subject that I want to bring up. and I want to say it in Dutch, so that it cannot be misunderstood. It is about the fellow who steals the other man's thunder. There is one kind of fellow who will read up everything he can find in the bulletins, and they get the first chance to talk, and by the time the other man gets up to talk, there is nothing to say; the first man has stolen his subject. Now that is wrong. Let each man stick to his text. First of all, the institute speaker must know his subject, and beginning at the foundation, he must know the soil, and then he must know the people, and he must use a little commonsense. Advising people in this county where the stones lie so thick on the hillsides, to use a weeder in the potato patch is absurd.

I regard to funny stories, I want to tell you that I would any day rather listen to one of William H. Crane's stories than to a funeral sermon.

MR. WATTS: About advertising the institute: I have never been a County Chairman, so I talk very much from the standpoint of an old maid advising how to raise children. But I believe that personal work counts here, as in everything else. A few days before the meeting, why not go to the telephone and call up your neighbor, and ask him to come to the meeting, and then call up another, and keep it up until you have covered the ground. Then a bunch of post cards will do good work. They cost but little, and can be addressed to every farmer in the district, making just enough difference in them to make them individual. They have been about co-operation, and I believe in it; when we go out as institute leaders, we should co-operate with the County Chairman to make that institute the best that can be had. And when I go out among the people and see a man whose fences are all run down, and who buildings are in need of paint, I want to talk co-operation; it is money and knowledge that he needs to put him on his feet. In regard to encroaching on the other fellow's time, I want to say that on one occasion a lady stole all my time, to the great edification of the audience; she said more in that half hour than I could have said, and said it better.

Now, just a word about stories. I believe in originality, and I do not like to see the originality of a man or woman repressed. Some of us can't help but tell stories. I, myself, will inevitable drift into something humorous before I get through with my speech. But I believe the stories should be all right. There is no harm in a little mirth. I believe we should be careful about boring. We should have a little sympathy with that fellow in the audience. But in our instruction, let us be natural; there will be less chance of boring our audience than if we repress our individuality entirely.

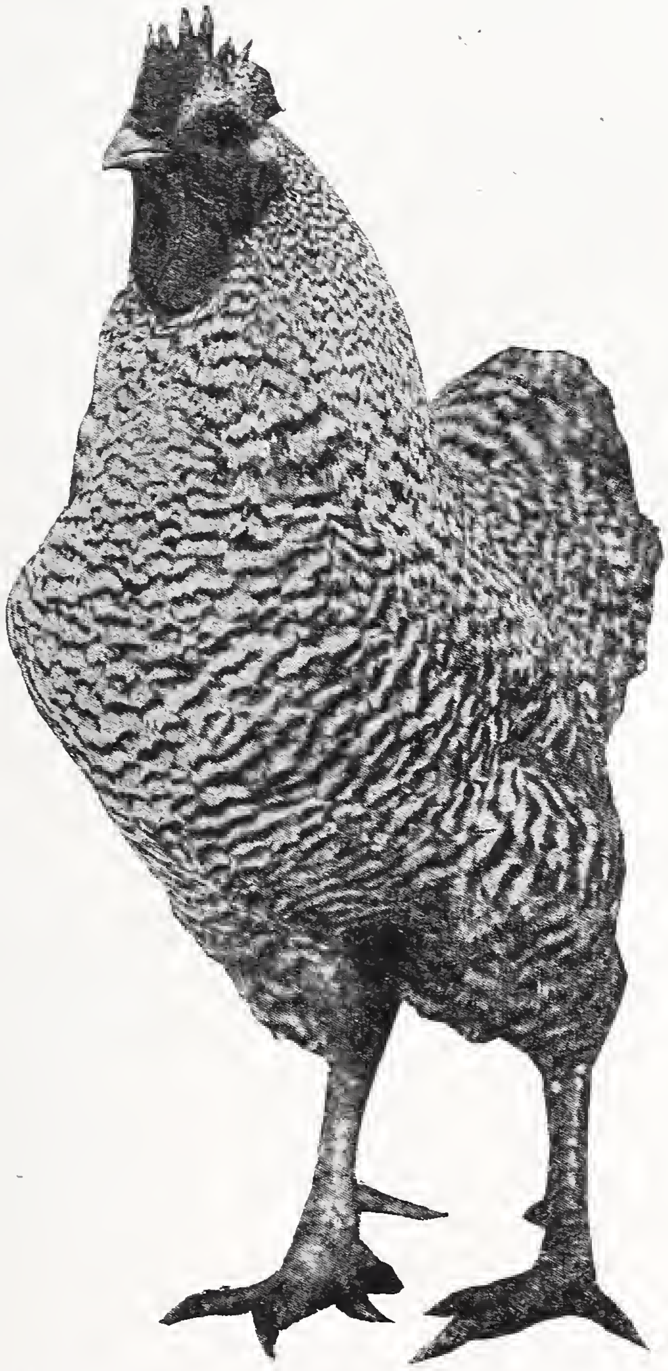


Fig. 1. A Good Type of Market Bird.

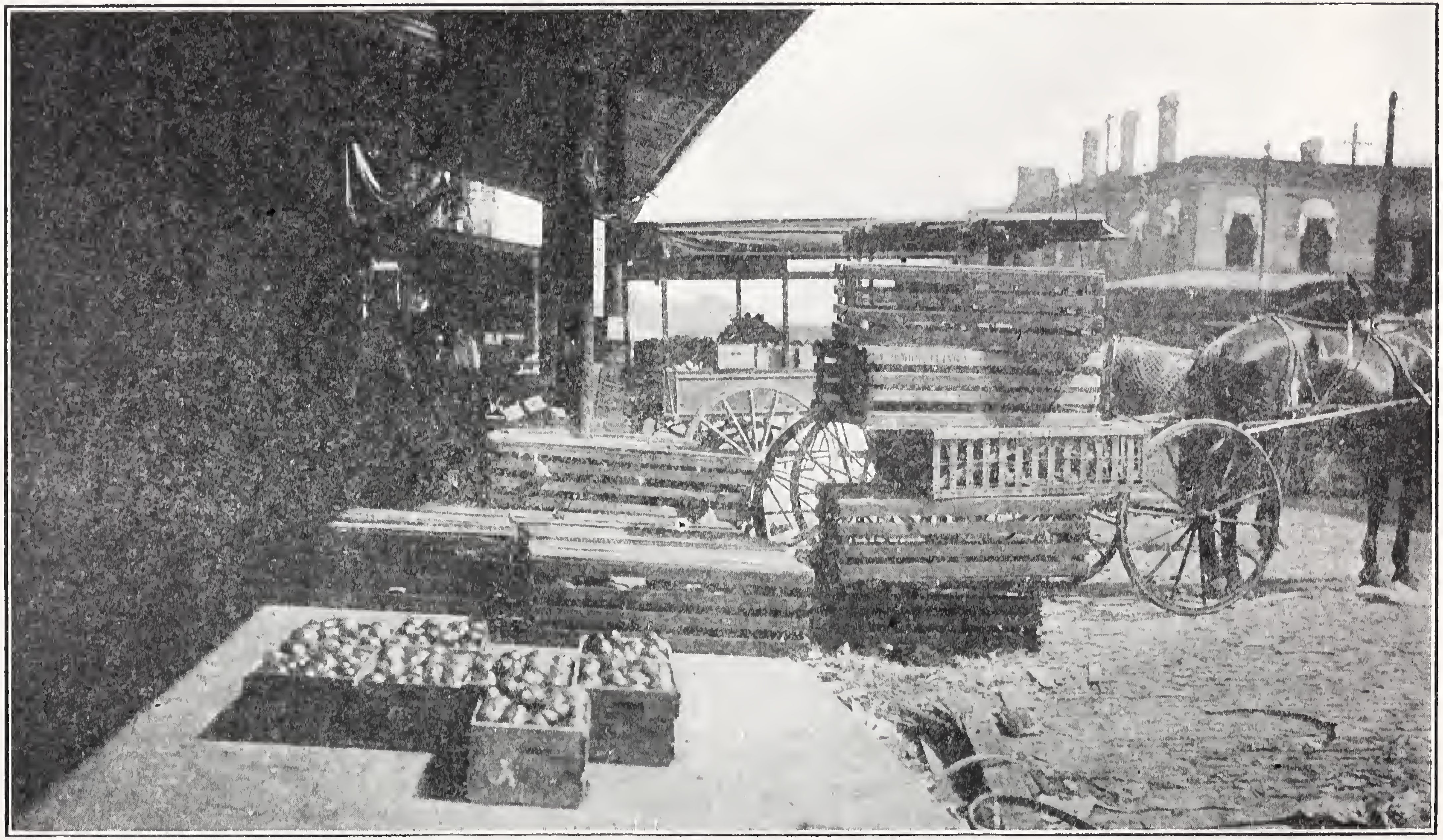


Fig. 2. Coops of Live Poultry in a City Market.

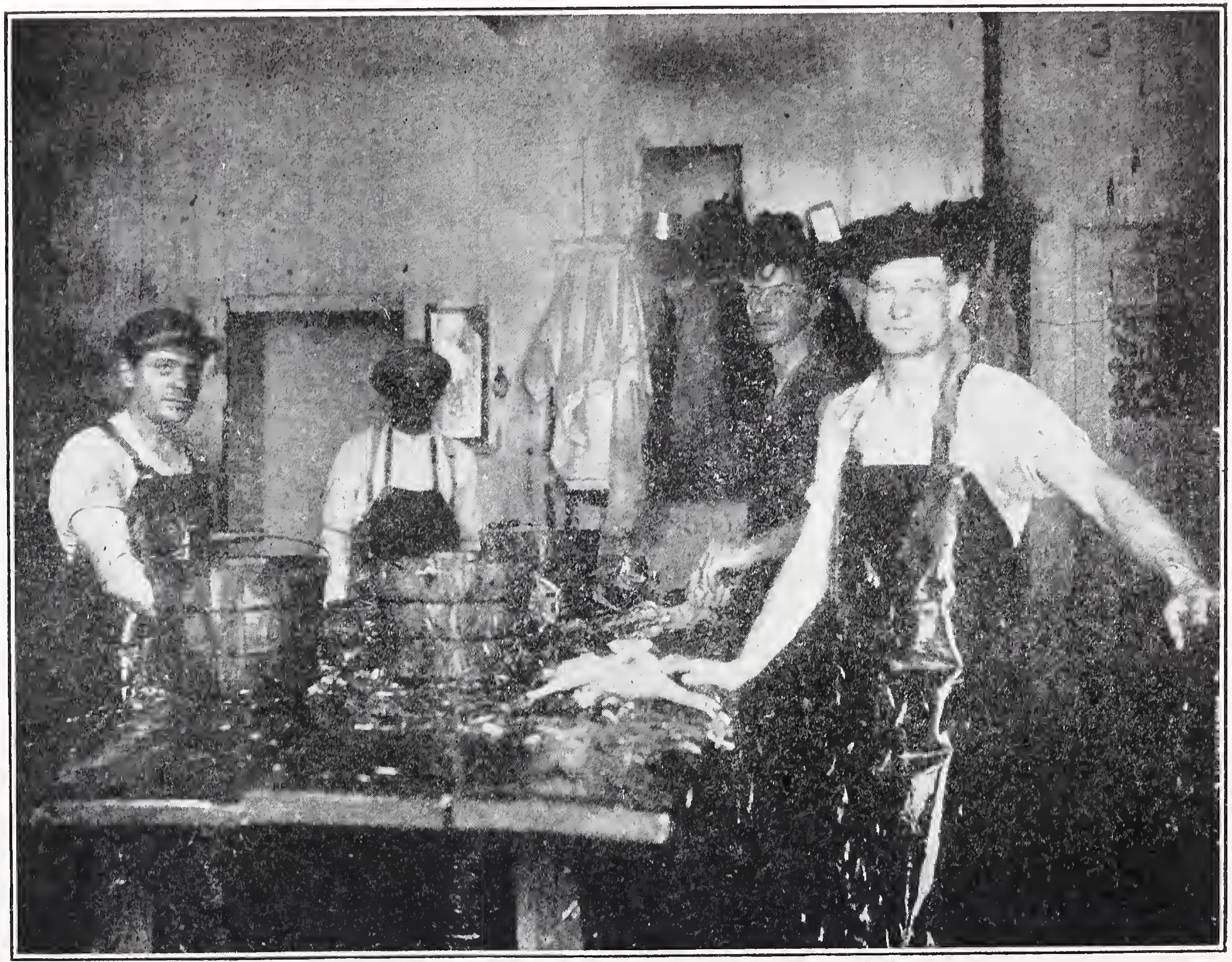


Fig. 3. A Room Where Poultry is Scalded.

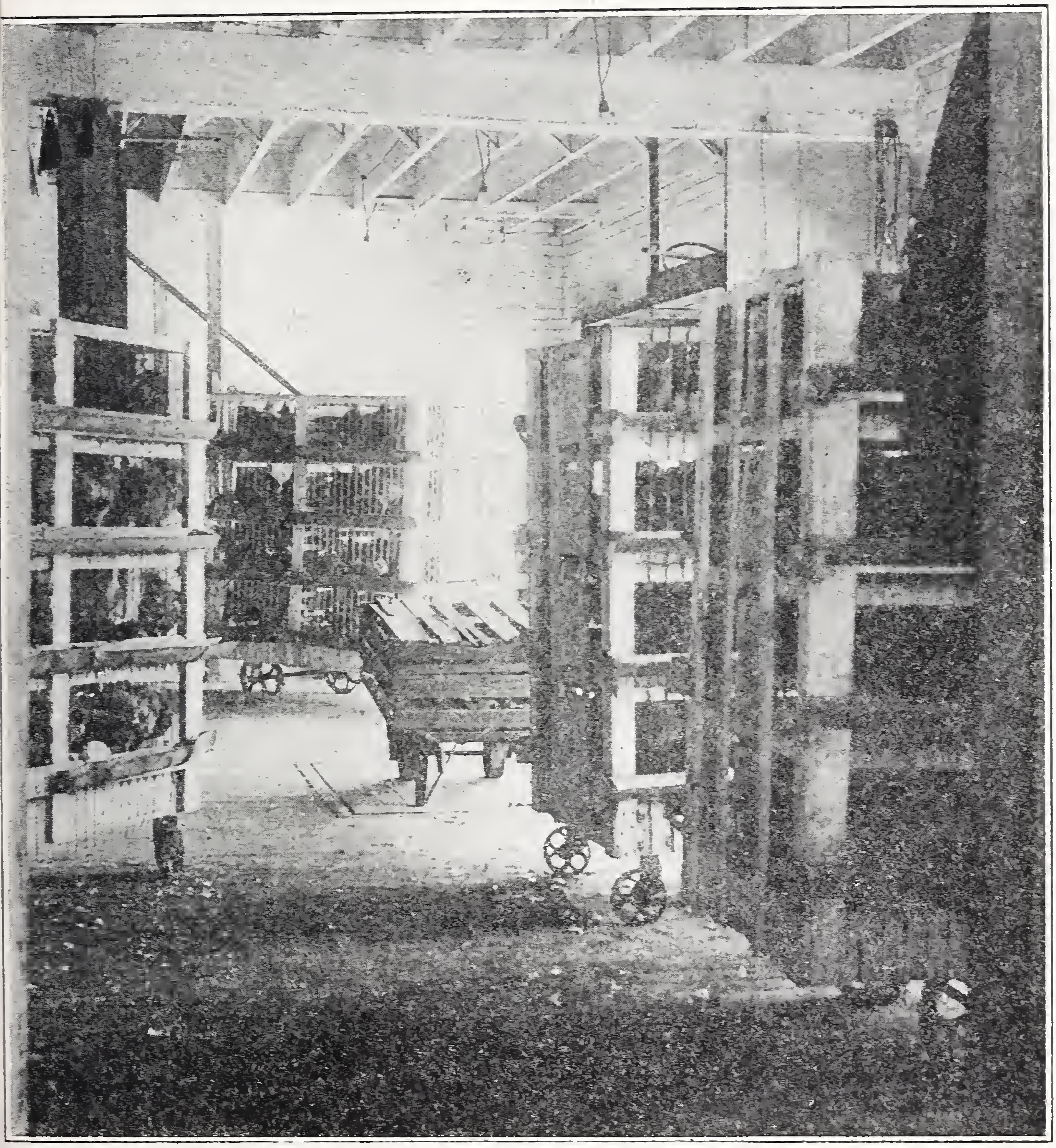


Fig. 4. Entrance to a Feeding Station.

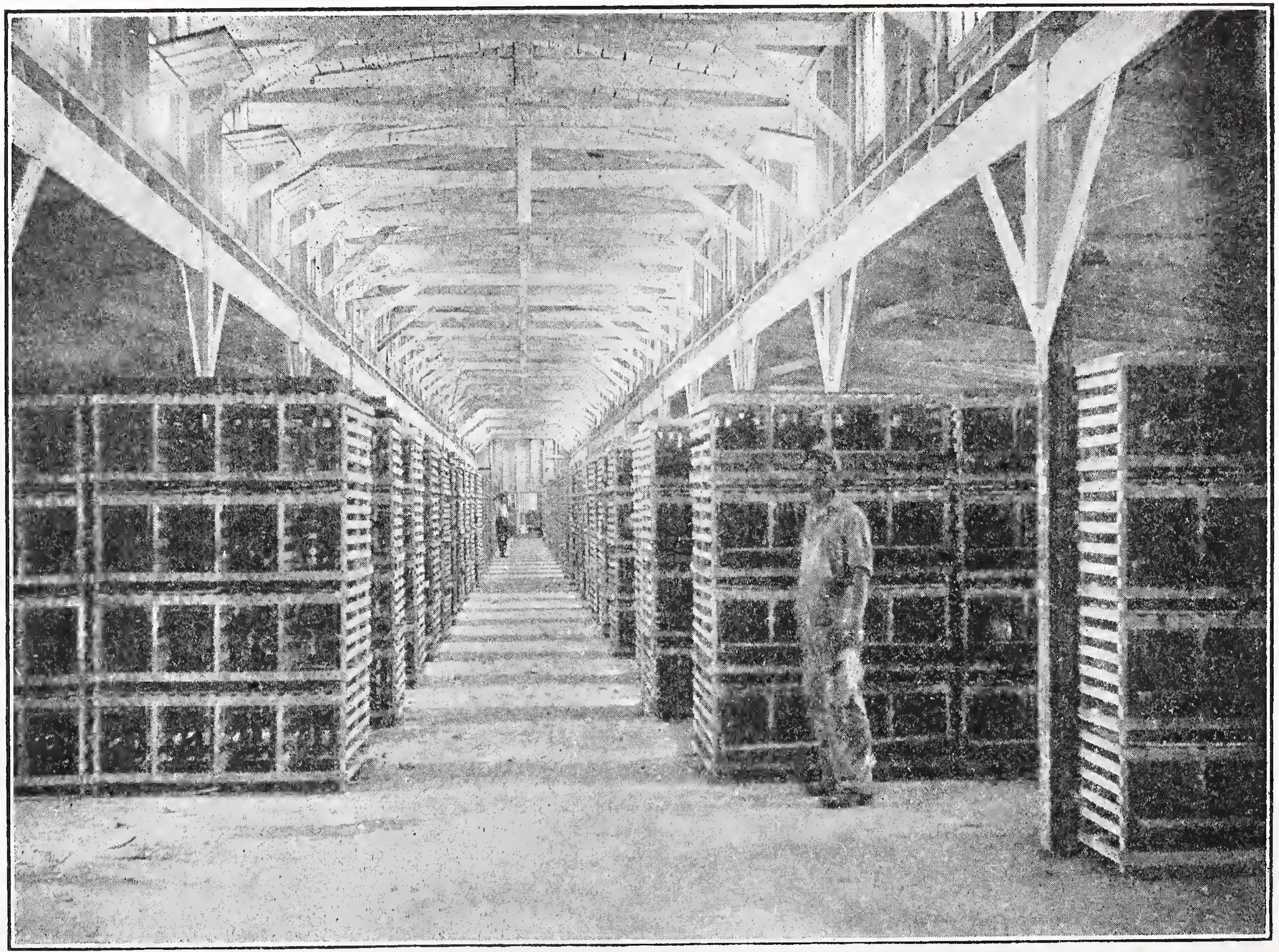


Fig. 5. Interior of a Feeding Station.

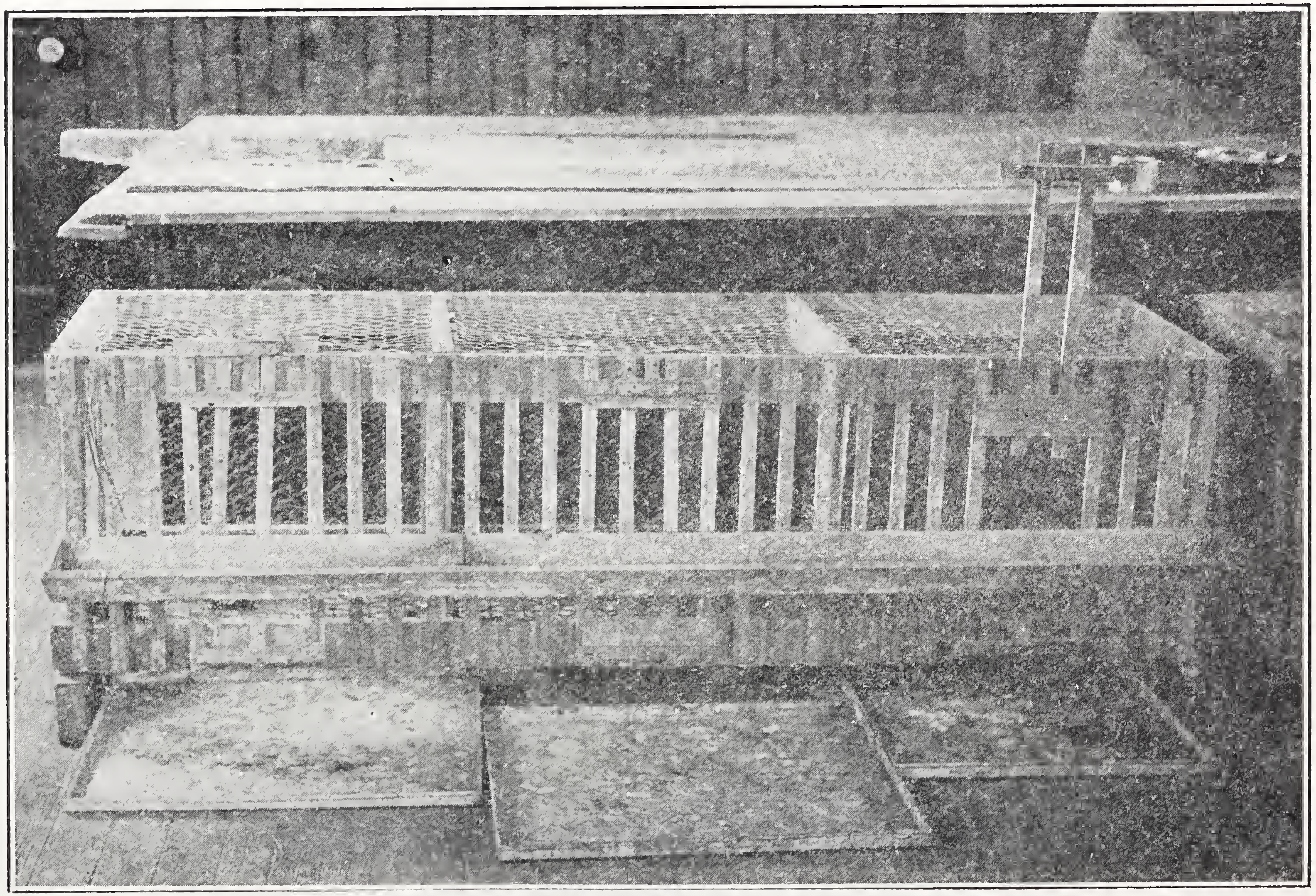


Fig. 6. A Convenient Fattening Crate.

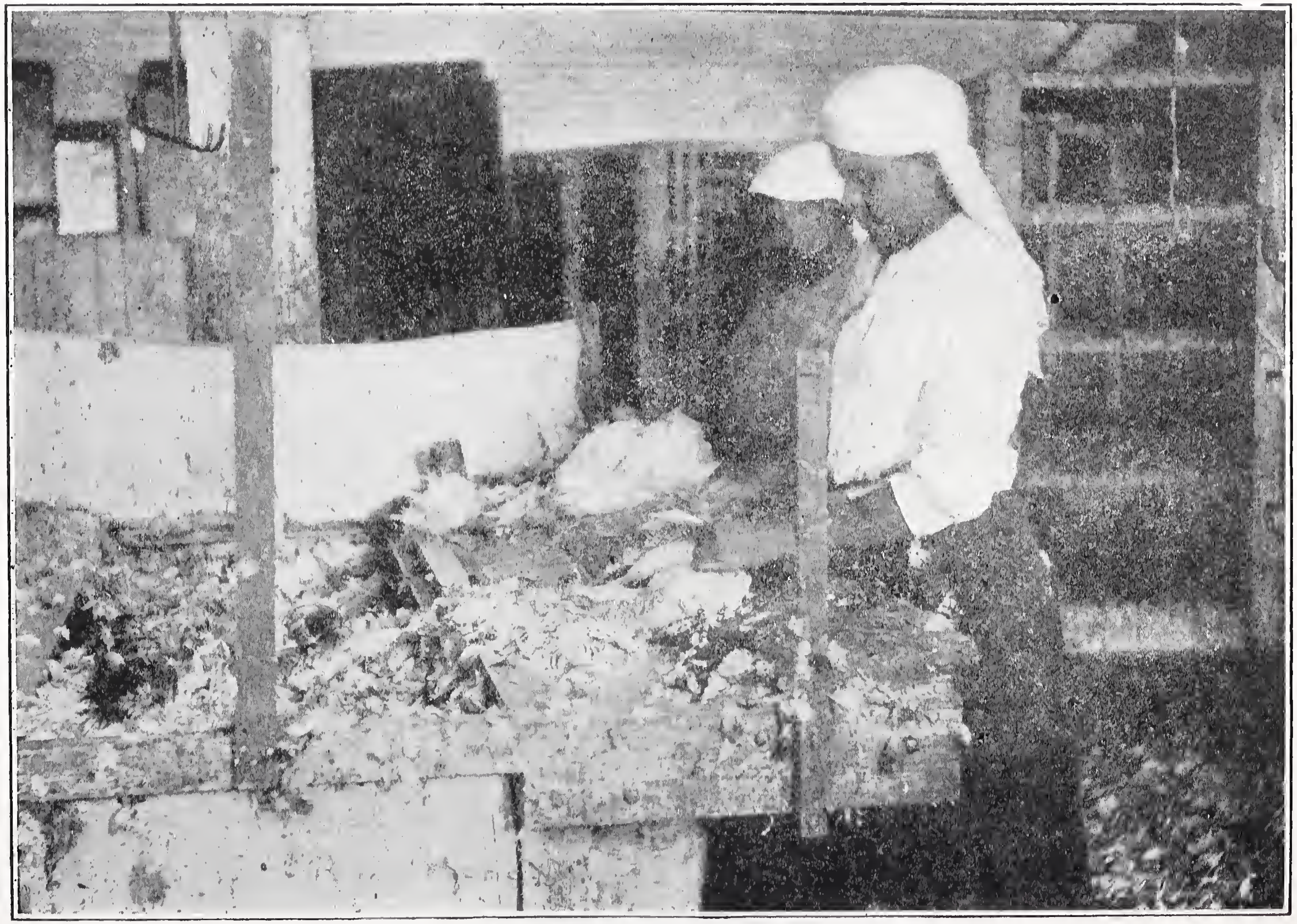


Fig. 7. The Bench Method of Killing Poultry.

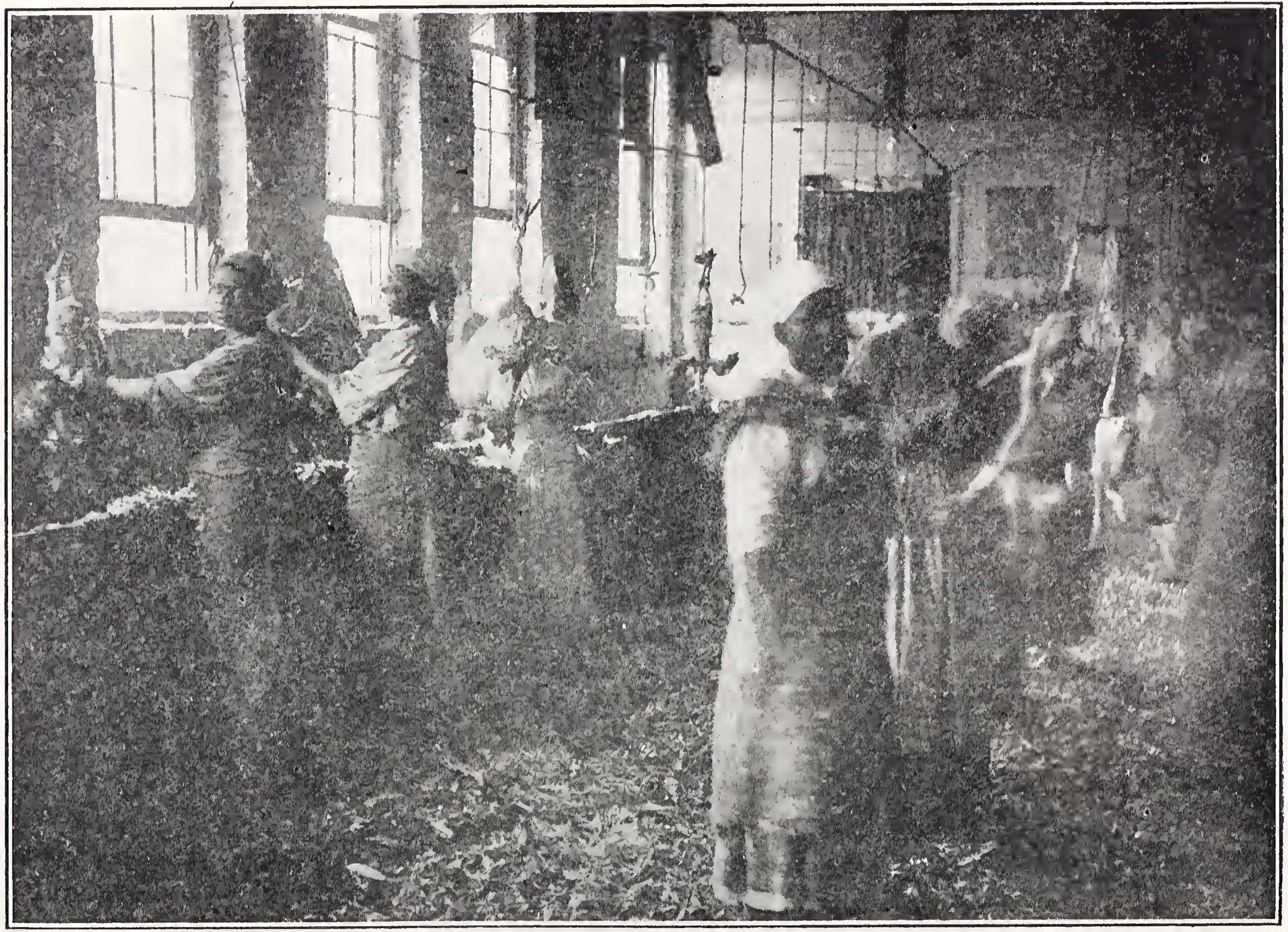


Fig. 8. The String Method of Killing Poultry.

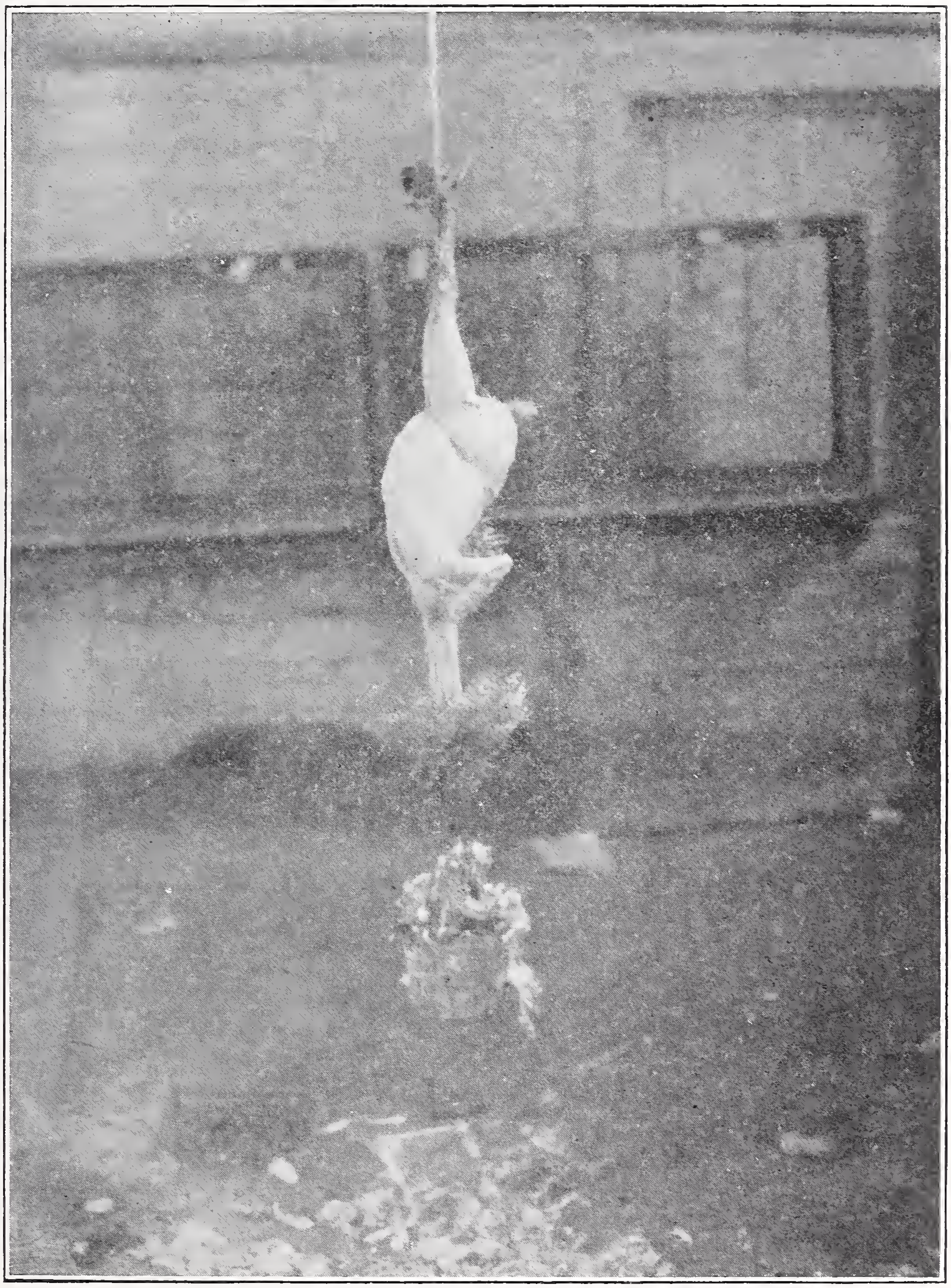
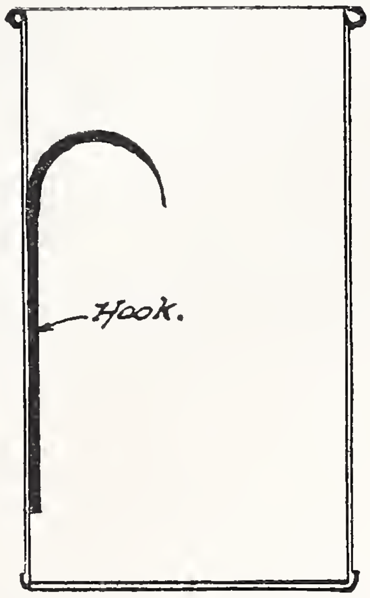


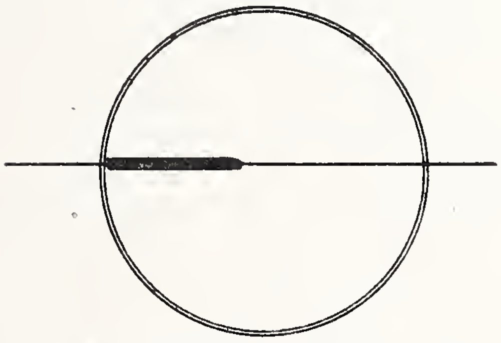
Fig. 9. A Dry Picked Bird with Weight on the Head.

Figure. 10.

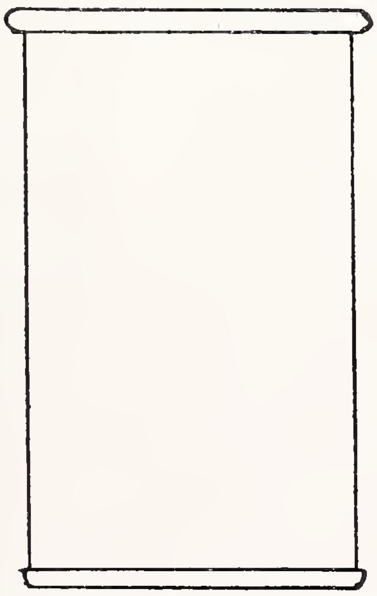
A Blood Can.
used in.
Dry Picking of Poultry



Inside Elevation



Plan looking down



Outside Elevation

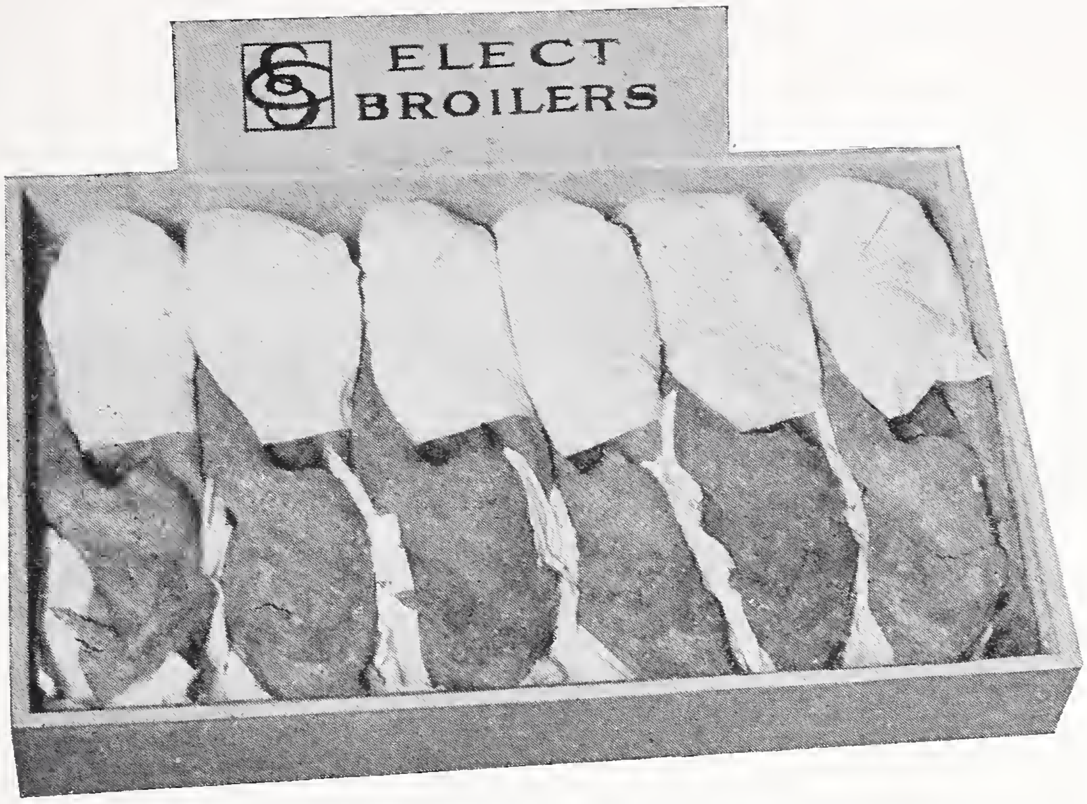


Fig. 11. A Fancy Box of Broilers.

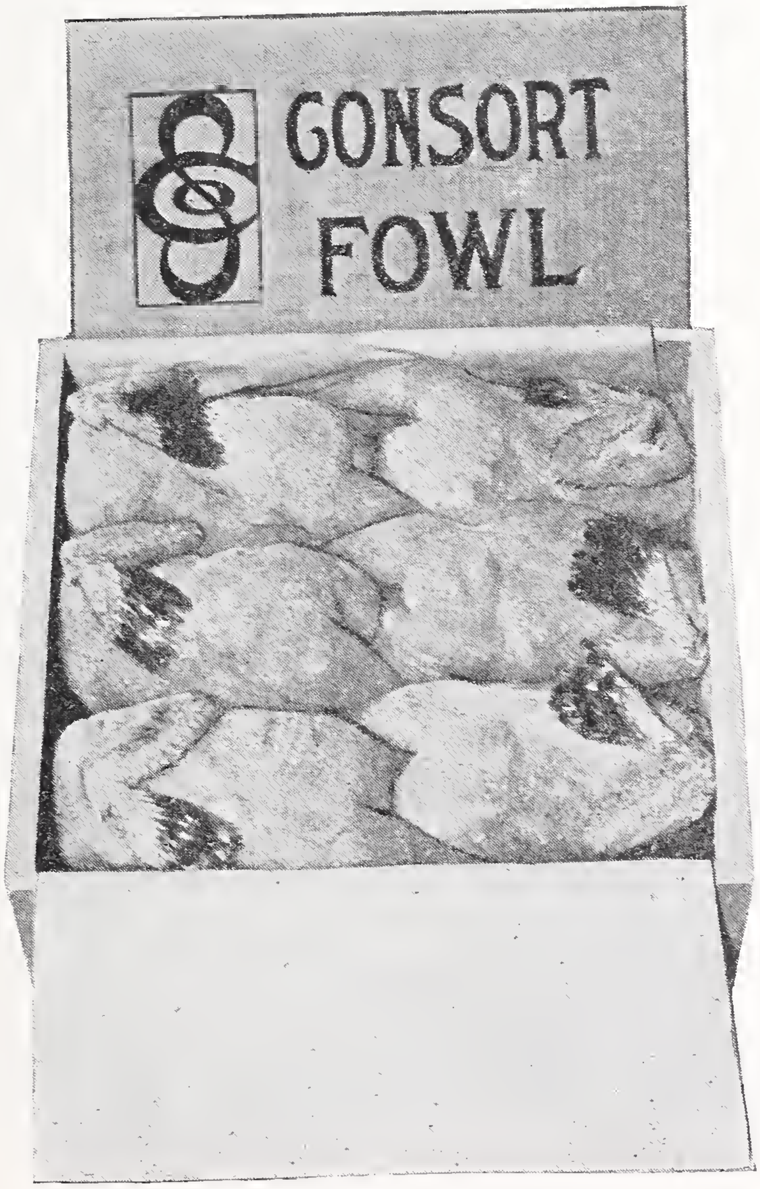


Fig. 12. A Box of Dressed Fowl.

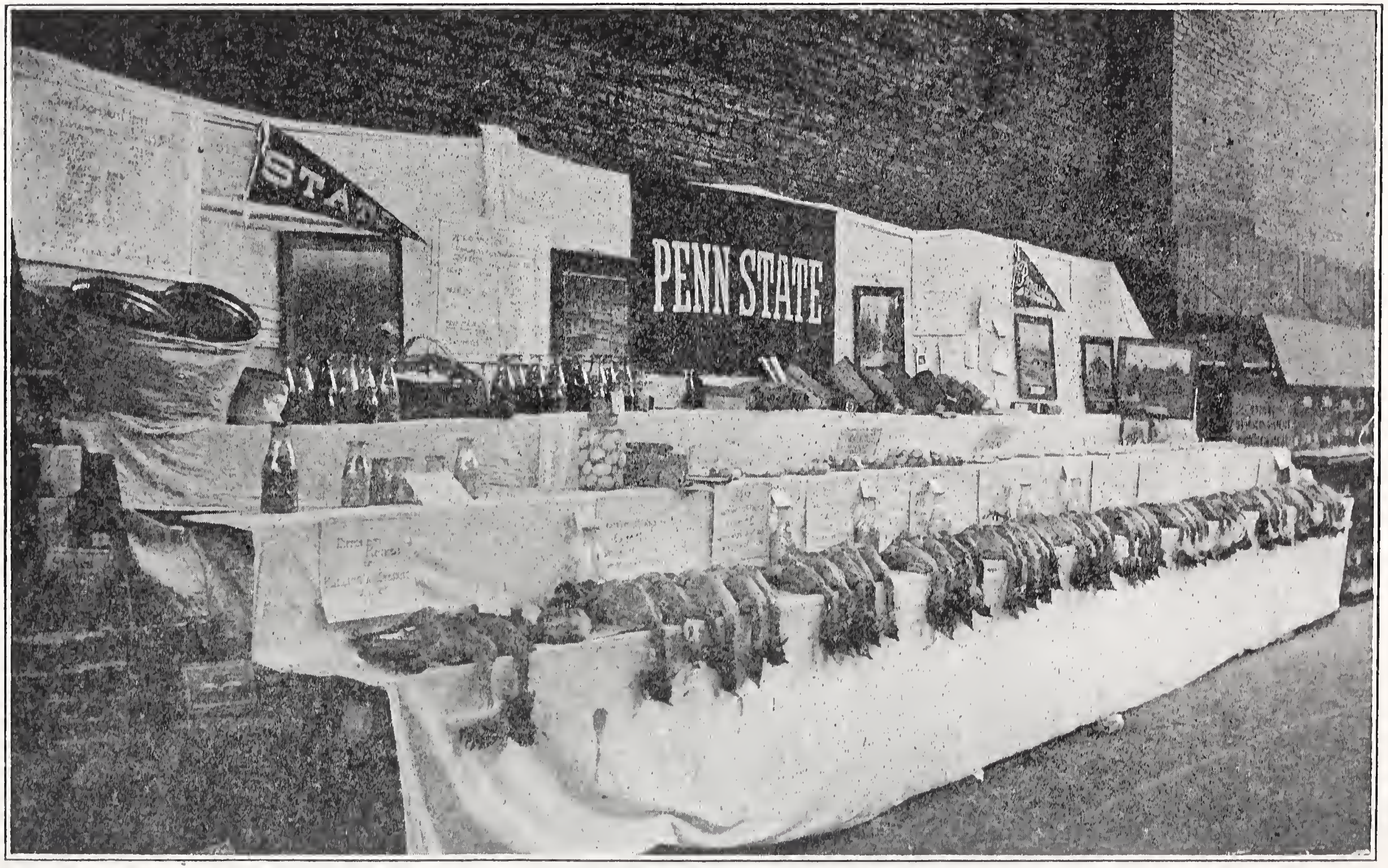


Fig. 13. Penna. State College Poultry Exhibit for the Season of 1911-1912.

MISS THOMAS: May I bring out another thought or two? I believe it is all right for women to be on the force, and I think there should be more women on the force than there are now, but I bespeak for them the courtesy of the men of the section with which they have to travel. These women also have to leave their homes, and make even greater sacrifices than the men do, and there are many ways in which you can make their travel more pleasant. I do not say you should look after their baggage, because every woman should go into the work as a business woman, ready and willing to do her part, but just the ordinary courtesy due to a woman, without any special attention or wagging of the tongue.

One other thing: We have not as much charity and kindness for the other workers of the force as we should have. We are all doing the best we can, and where we fail, I ask for just a little more consideration and kindness, and application of the Golden Rule.

MR. SHUEY: In all the discussion here we have heard very little in favor of the County Chairman. Now, we all know that the Lecturer is well paid, and the County Chairman gets nothing at all. It is hardly right to ask him to neglect his business when he gets nothing for it. He is entitled to be paid for his work as well as the lecturers, I think.

MR. BARNES: In regard to the County Chairman, I believe he gets more than he gives, in every case.

MR. COWAN: I am very glad I am here this afternoon to listen to this discussion, and I am very thankful to our Director for sending to our county the able people he did. I don't know that there has been one word of complaint in our county regarding any one of the people that were sent there. I don't know what the lecturers said when they left us, but I believe our people were thoroughly satisfied, and will be glad to see the same lecturers back again.

Now, so far as local talent is concerned, we have hard work to get local talent, and I think it is a good thing, if not carried to extremes, to interest the people of the community by getting the local talent to take part.

MR. FENSTERMAKER: I don't allow any local talent in my meetings. I don't want it; the people we get are well paid and should know their business, and the audience does not come to hear local talent.

So far as the speakers are concerned, I think we can do better work with fewer lecturers. I learned something from the Movable School.

It is all right to have a little music or singing at the institutes by local talent, but that is as far as I care to go.

DIRECTOR MARTIN: The hour is now six o'clock. I have said very little, because I have been an interested listener. I congratulate myself on one thing: That is that there has not been as much reflection on the State management as there should have been. I realize that there are many obstacles that must still be overcome. Take the question of program; We have tried to get them out so as to meet every need, and it is the best we can do. Take our bulletins for the past few years. If you will look, you will see that we have outlined the programs there, and you will also see that we advise you not to have more than two speakers to a program, and let them thrash out their subjects thoroughly.

Then regarding the local talent: Ten or fifteen years ago we were very glad to have local talent. I look over this audience and see Mr. Peachey and Mr. Northup, and fifty others. Who are practical farmers, and the strength of the institute, and all of them developed from the local talent. Think of this: Pennsylvania stands out preëminently among the states of the Union as one that has evolved from the ranks of the farmer the teachers and field workers that we have today. Now let us be reasonable; let the County Chairman be careful to select from among the young men and young women who compose his talent the brightest star that he can find—those who have talent that can be developed along the agricultural line,—and then place them on the program immediately following the speaker, and following the same line of thought. Possibly some of the criticism of local talent is a little ill-advised. What has led to this? The local chairman is confronted with the problem of instructing the people, and of entertaining them; but we want the character of that entertainment to be such as will elevate the community, and lift them to higher living in every line of thought. If it were not for our local talent, where would we get our field helpers in years to come?

I want to thank the County Chairmen, before I close this session. Your work is not a perfect one; you are handicapped in many ways, but the most earnest worker we have is the man back on the farm—the County Chairman. You make mistakes, but you are willing to learn. You want to be kind to these men who come to you. You may not always agree with them, but you want to be kind to all of them.

Now, then, another word. Some of you workers when I come to make up the schedule for next year, are going to meet with a disappointment. May I say a word to you, and say it frankly. In order to keep within my appropriation, it will be necessary to cut the institute force from seventy-five to about forty-five or fifty workers. This is not due to any want of respect for any of the workers, but simply because it has to be done. Our funds will not allow us to hold another institute than those given in the schedule, or to furnish another worker. and those of you who are not placed on the roll this year will understand that it is for this reason only. So, in making up your program, I would ask the county chairmen to consult with your people, and ascertain just what subject they are interested in, and then write me, so that we can arrange to give you the speakers to cover those subjects. Will you help me in this way when you go back to your counties?

I want to thank you for the interest shown in the discussions this afternoon. Some of the speeches were a little strong. Some sharp little things have been said. Nothing wrong about that. I would not give much for the person who does not say what they have to say, and say what they think, and then after it is over, shake hands on it, and say "How are you?"

The meeting now stands adjourned until 7.30 this evening; which will be the closing session of this institute.

Thursday, May 23, 1912, 7.30 P. M.

Mr. W. A. Crawford in the Chair.

The CHAIRMAN: The meeting will please come to order. The first number on the progarm is "Some Lessons in Natural History," by Mr. W. H. Stout. This lecture will be illustrated with lantern slides. Mr. Stout will now address us.

(This paper was given Mr. Stout for some revision but was not returned in time when the copy of the Bulletin was given the printer).

The CHAIRMAN: The next number on the program is "Modern Methods of Finishing and Dressing Poultry," by Prof. R. V. Mitchell of State College. This lecture is also illustrated. I have the pleasure of introducing Prof. Mitchell.

Prof. Mitchell spoke as follows:

SOME MODERN METHODS OF FINISHING AND DRESSING POULTRY

By R. V. MITCHELL, State College, Pa.

The fattening and dressing of poultry is a subject which should interest the people of Pennsylvania more than it does. If you people will become acquainted with the markets, you will see much poultry that is in poor condition.

One of the handicaps in the marketing of farm-raised poultry, is that they are usually of mixed breeding. These mongrel chickens vary in size and shape of body and in color of the skin. They do not make an attractive appearance when they are dressed, as they are too uneven in size, shape and color.

Spring chickens can be purchased in many parts of Pennsylvania in October and November for, from six to eight cents per pound. These birds are usually bought by the huckster and shipped live weight to the wholesale dealers in the cities; these dealers in turn sell to the retail dealers.

Most of these birds were in poor condition when they left the farm; and there is no chance for them to be put in better condition after they once leave there, because of the present system of handling live poultry in the East. Old birds may have a large amount of fat on their body and at the same time be very tough. This toughness is due to age and also to the exercise that they get on free range. In order to improve the quality of old birds, it is necessary to crate fatten them for a period of about two to three weeks, before they are killed.

The persons who are making the most out of their poultry are those who are careful to have their birds well fattened, and then place on the market in a neat and attractive way.

I shall show you a few lantern slides this evening which will give some of the methods of fattening and dressing poultry, which are used in the Eastern part of the United States and also in the Central West. I will also show you how to kill and dry pick a live bird.

A good market bird is one that has a good shaped body, good health and the ability to stand forced feeding in close confinement. The body of the bird must be long, and deep and wide, if we have a bird that will dress well and be attractive on the market. Figure (1) shows the type of bird that is desirable for market. If the farmers would mate their flock with a bird of this type and character, they would have poultry to sell in the fall of the year that would bring them profit.

The Barred Plymouth Rock is a type of bird that is especially good for market. The markets demand that poultry shall have yellow shanks and skin; the Barred Plymouth Rocks fill this requirement, besides having the ability to convert food over to chicken to a profit to the poultry feeder. It should be the aim of the poultryman and farmer to select out of his flock for breeding, only those birds that are of a good market shape and then have well shaped bird to head the flock; If this kind of breeding is followed much better poultry will be put on the market.

When poultry is shipped alive to the market it is often subjected to bad handling. Figure (2) shows a number of crates of birds which have been shipped to the city market. These crates are allowed at times to stand in the hot sun for several hours, which results in a loss in weight and also in the death of some of the birds. This is one of the reasons why the returns for a coop of poultry aren't as much as they should be.

There are dealers in the various cities who buy poultry in large numbers and kill and dress them for the local trade. (Fig. 3) shows one of these killing places: Some of these are kept in a sanitary condition, while others are not; In fact, they are filthy. The water used in scalding the poultry is kept in a large vat at the side of the room; several hundred birds are sometimes scalled without changing the water; thus the water becomes very filthy. Men are employed in these places to kill and scald the birds. One of these men will scald and pick about 500 birds in a day. In scalding the birds much filthy water is absorbed by the skin. The skin of scalded birds is easily broken, which furnishes a means for bacteria to enter the carcass and causes it to decompose. After the birds are picked they are cooled either in ice or ice-water. When the birds are allowed to soak for a number of hours in water they absorb several per cent. of it. This practice hurts the keeping quality of poultry. Scalded poultry will not keep in good condition very long on the open market.

The methods practiced in the Central West are quite different from those in the East. As a rule the poultry is shipped to a feeding station. A feeding station is a place where the poultry is fed for a period of ten day or two weeks, so that they will be in first class condition when killed for the market. (Figure 4) shows the entrance to a building of this kind. The birds are weighed and placed in feeding batteries. When one of these batteries is filled it is taken into the room where the feeding is done. Wheels underneath the batteries aid in moving them. (Fig. 5) shows the arrangement of the feeding room. This room is over 300 feet long and has a capacity of 40,000 chickens at one time. The ventilation is carefully looked after. This building has means of ventilation on the sides and also at the roof. You will notice the batteries are made up of four tiers of coops. Galvanized iron pans are used between each tier to collect the droppings. These pans are cleaned out every day and the room is kept very sanitary. A wide aisle is in the center of the room and also between each stand of batteries. A stand of batteries is divided into small pens about two feet square and twenty inches high. In a space of this size, from four to six birds can be confined. The birds are fed from a trough which is hung on the front side of the battery.

The feeding stations are equipped in much the same manner; however, some are more advanced in methods and equipment than others.

The feed that is generally used in feeding consists of white bolted corn meal, low grade flour, oat flour or fine ground hulled-oats and wheat middlings. Buckwheat middlings are good for fattening, but it is difficult to secure them in some sections of the country. All fatteners do not use the same ration, but in the main there isn't very much difference. A very satisfactory ration is composed of

24 ℔s.	Bolted Corn Meal
6 ℔s.	Low Grade Flour
1 ℔.	Wheat Middlings
1 ℔.	Buckwheat Middlings
1 ℔.	Pea Meal
1 ℔.	Oat Meal

Some feeders add tallow to their ration. Better flavored poultry can be secured by not feeding tallow. The ground feeds are thoroughly mixed together and then moistened with buttermilk. About two pounds of buttermilk should be added to each pound of dry feed. This will make the feed of such consistency that it will pour out of a bucket. The birds should be starved for twenty-four hours before beginning the feeding process. This is to get the bird well emptied out, before starting on a new feed. The first four or five feeds should not be more than one-half as much as they will eat; at the end of this time they can have all they will clean up in about twenty minutes. The birds are usually fed twice a day. The maximum gains can be secured in about ten days to two weeks as a rule. It is unprofitable to feed for a longer time than two weeks. Water should not be given the birds unless in very hot weather. In feeding for this length of time it is not necessary to supply any grit or green food. Much better results can be secured with buttermilk than with skim milk. The mixing of the feed in these houses is usually done by power mixers, and in this way the labor is made as light as possible. Poultry feeders can secure a gain of 25% to 35% on birds in two weeks.

From these various methods, every man who feeds poultry can get something which will benefit him. (Fig. 6) shows a fattening crate which can be successfully used by the man who produces poultry on a small scale. This crate is six feet long, twenty inches wide, and twenty inches high. It is divided into three apartments each two feet long. The front is made of lathe placed about two inches apart. The top, back and ends are made of inch mesh wire netting. The floor of the coop is made of inch mesh woven wire netting, number nine wire being used. The wire makes a very satisfactory floor, because the droppings pass thru to the galvanized iron pans underneath, and the birds are kept in a sanitary condition. The birds are fed from the trough on the front of the coop. This coop is easy to construct and will hold from fifteen to twenty birds at one time.

The quality of the poultry fed by this method is much superior to the ordinary run of poultry. The fat is well distributed thru the muscle tissue, the meat is juicy and tender, and the birds present a good appearance on the market.

After the poultry has been fed for two weeks they are starved for twenty-four to thirty-six hours. This is to get the body rid of all waste products. During this time they are allowed to have water to drink. I will now show you some of the methods used in the dressing of the birds. (Fig. 7) shows what is known as the bench method of picking. The operator takes the bird from the coop, fastens its head to a sharp hook on the side of the bench; with one hand the bird is pulled back over the bench, and with the other hand the blood vessels in the neck of the bird are cut and the brain is pierced so that the feathers loosen and can be pulled out easily. You can see the feathers are pushed in front of the operator into a large box. The blood drains thru a hole in the bench into a pail. The bench is covered with a cushion made of canvas cloth and some filler. This is to keep the body of the birds from getting bruised. This method is objectionable because the cushion becomes very unsanitary unless it is changed often. It is also the cause of breaking the delicate skin on the outside of the bird and when the carcass is cooled it gives a bad appearance and also affects the keeping quality of the bird.

Another method that is used extensively in poultry houses is what is known as the string method. (Fig. 8) shows a room where this system is practiced. One end of the string is fastened to a rod or joist overhead. An iron nut is fastened to the end. The bird is taken out of the coop and held in the left hand. The string is held in the right. The legs of the bird are placed against the string; then the end of the string is passed up over the legs and to the right side of the string. You will find the nut holds the string securely on the bird, for the weight of the bird pulls it against the string and the legs.

The bird is killed by cutting the veins in the neck and piercing the brain. The usual practice is to hang a weight on the bird's head to keep it in a more rigid position until the blood is drained out. This is shown in (Fig. 9). This method has some good qualities. The bird is held in the best position to get good bleeding. There is not so much danger of breaking the skin as in the bench method. But where this method is practiced it is often unsanitary for there is nothing to collect all the blood as will be seen in (Fig. 9). (Fig. 10) shows a can five inches high and three inches in diameter. It is made of galvanized iron and is weighed so that it will weigh about one pound. Inside the can one and one-half inches from the top is a hook which is soldered to the side of the can. This hook is to hold the can to the birds head. As soon as the bird is killed this can is put over the head to catch the blood and to keep the bird in a rigid position. If this can were used by those who use the string method, their rooms could be kept in a sanitary condition. You can readily see that when this can is used, that the string method is the most satisfactory.

The man who kills the birds removes the body, wing and tail feathers. This is what is called roughing the bird. For this work he is paid one cent each. Experienced men are able to rough from four to six hundred birds in a day. Those birds are passed onto men and women who remove the pin feathers. It requires about six pinners for one first class rougher. For this work they receive about a cent and a half per bird. After the feathers are all removed the feet and heads are thoroly washed. The birds are then hung by the feet on racks to drain off. These racks are mounted on trucks and are made V shaped to allow the birds to drain off without dripping on each other. After the birds are drained the heads are sometimes wrapped in paper. This keeps them more sanitary when they are packed for shipment, and gives them a neater appearance on the market. The truck load of poultry is then run into a room with a temperature of about 38°. The birds are allowed to stand there for twenty-four to thirty-six hours or until all the animal heat has left the body. Then they are graded according to size and quality and are packed in boxes which hold one dozen each. (Fig. 11) shows a box of birds that weigh twenty pounds to the dozen. Not that each bird is wrapped in paper and that the head and feet are not exposed to view. You will observe that the birds fill the box snugly so that they do not bruise in transportation.

Fig. 12 shows a box of old fowls. These weigh about sixty pounds to the dozen. The feathers on the tip of the wings are left on the old fowls. Note that the box is lined with paper, but the birds are not wrapped as these in (Fig 11). The packed birds are put into storage rooms and frozen. They are held in this way until they are sold on the market. Refrigerator cars are used in shipping these birds.

A great many feathers are collected in these killing establishments. The coarse feathers are kept separate from the body feathers. These are washed and dried and when they are put on the market, they bring from five to twenty-five cents per pound.

Fig. 13 shows a lot of dressed poultry that was exhibited at Williamsport, Philadelphia, and Pittsburgh this year, by the Pennsylvania State College, State College, Pennsylvania. The birds used in this exhibit were bought from the farmers and were a mixture of Barred Rocks, White Wyandottes and Rhode Island Reds. The birds were divided into lots of ten each. The lots weighed practically the same at the start. Several lots were fed whole corn and wheat, which is the usual feed used to fatten poultry by the majority of people. The gains on these lots were one to two pounds in three weeks for ten birds and the cost per pound gain varied from thirty-three to sixty-six cents. Farmers will sell these birds at six cents to ten cen per pound—or for less than it cost them to produce a pound of chicken.

Similar lots of birds were confined in crates and fed a mixed of bolted cornmeal, low grade flour, wheat midds, buckwheat midds; all of which were moistened with buttermilk. In the same length of time these birds had gained ten pounds per lot of ten birds, and the cost per pound of gain was as low as five to seven cents. Birds that are fed in this way can be sold for a better price because there is quality and quantity to a milk fed bird. This kind of feeding will be profitable to those who practice it.

There are two things necessary in the dry picking of poultry. One of these is to stick the bird in the right part of the brain, in order that the muscles which hold the feathers in the skin will relax and the feathers can be pulled out easily. The other is to cut the blood vessels in the neck in order to insure good bleeding. A knife suitable for this work is one with a narrow blade about two inches long. A good knife can be made by grinding down an old silver case knife. The head is held in the left hand between the thumb and forefinger. The cut for bleeding is made just back of the bony part of the head. The knife is thrust into the bird's mouth to the left side of the neck and a diagonal cut is made which severs the two main blood-vessels in the neck; this will cause the blood to flow freely.

The brain is pierced by starting the knife at the corner of the mouth on the left side of the head at such an angle that the point will pierce the brain about the center of the head and back of the eyes. This will cause the muscles to relax and the feathers can be pulled out easily. When the brain is pierced the bird is made insensible.

In removing the feathers, take first, those from the breast, second, those from the back, and leaving the tail and wing feathers for the last.

The poultry producers of Pennsylvania must use better methods of finishing and dressing their poultry, if they receive the benefits of the good markets of the State.

I thank you for your attention.

A Member: Is it sanitary to wrap the head of the bird in this way?

PROF. MITCHELL: Yes; the head is thoroughly washed before it is wrapped in paper.

A Member: Do all the markets demand this dry picking?

PROF. MITCHELL: Some markets demand dry picked poultry while others want scalded poultry. But the best markets require dry picked poultry.

A Member: Would it be safe to allow them to be shipped in that way, if they have not been starved?

PROF. MITCHELL: The birds that are not starved before they are killed will not stand shipping so well as those that are well starved.

MR. PERHAM: How can they grow them cheaper in the West than here?

PROF. MITCHELL: Because they are able to get a greater range—more insects—and cheaper feed. The land produces grain crops without the use of fertilizers.

MR. SEEDS: How about feeding sand?

PROF. MITCHELL: Sand is used sometimes to increase the weight of the birds—shelled corn is sometimes used for the same purpose.

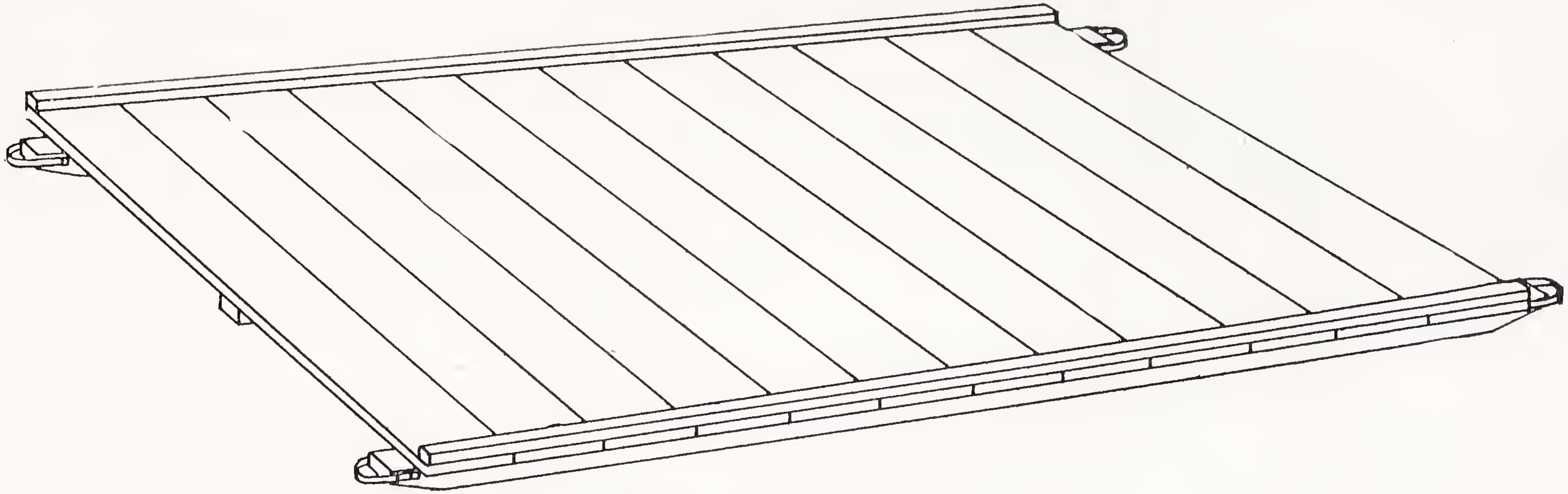


Fig. 1. Mixing Platform.

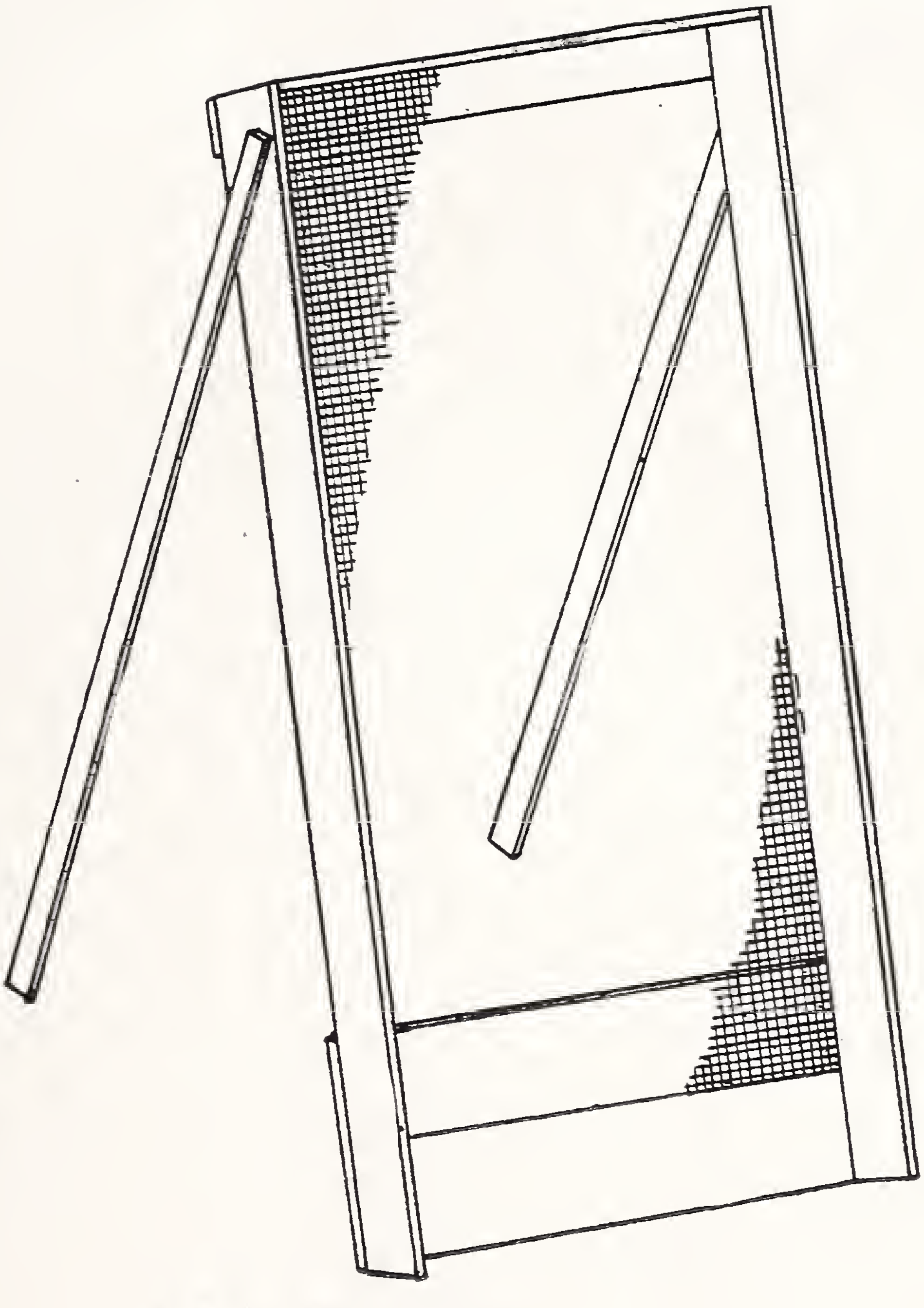


Fig. 2. Sand Screen.

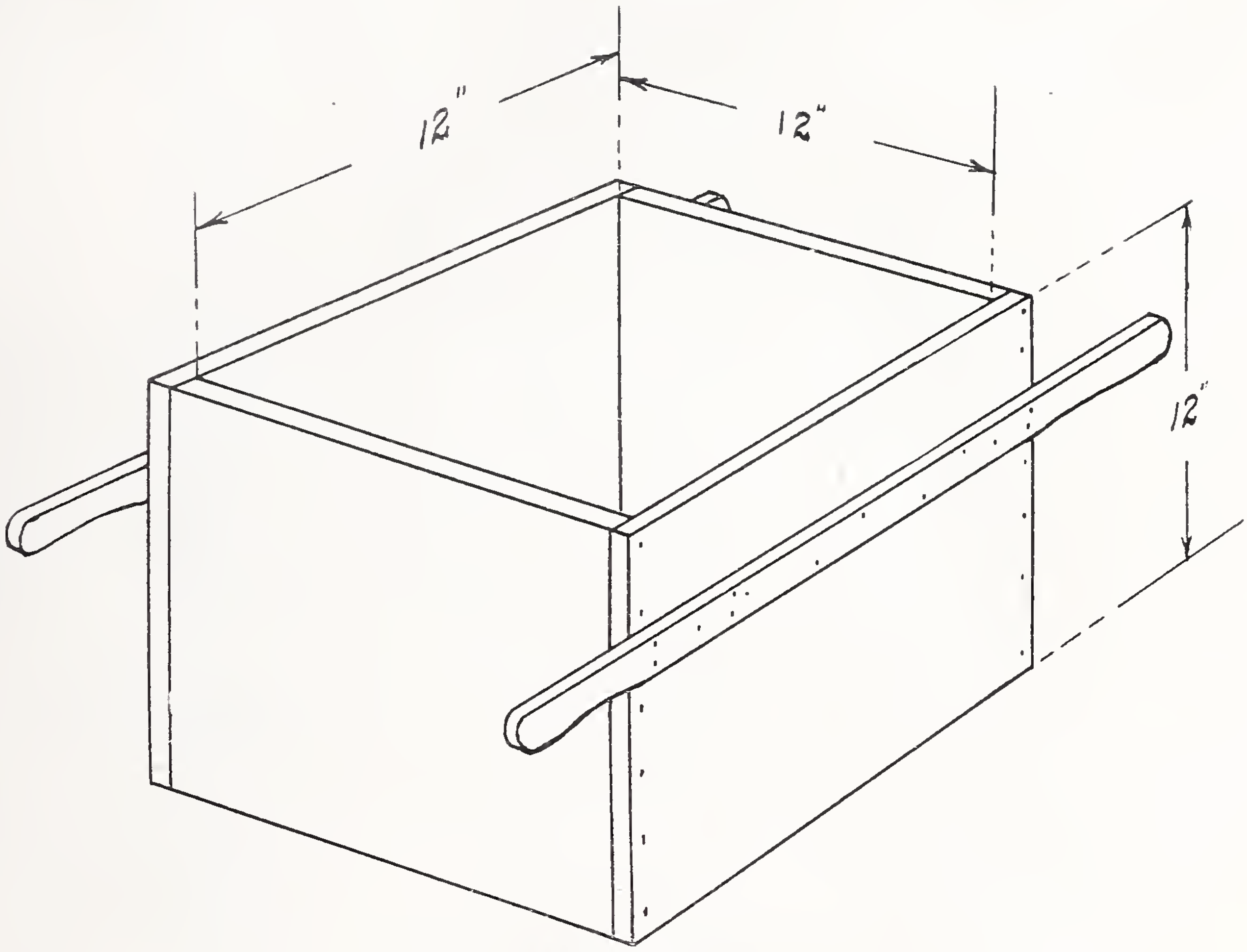


Fig. 3. Measuring Box.

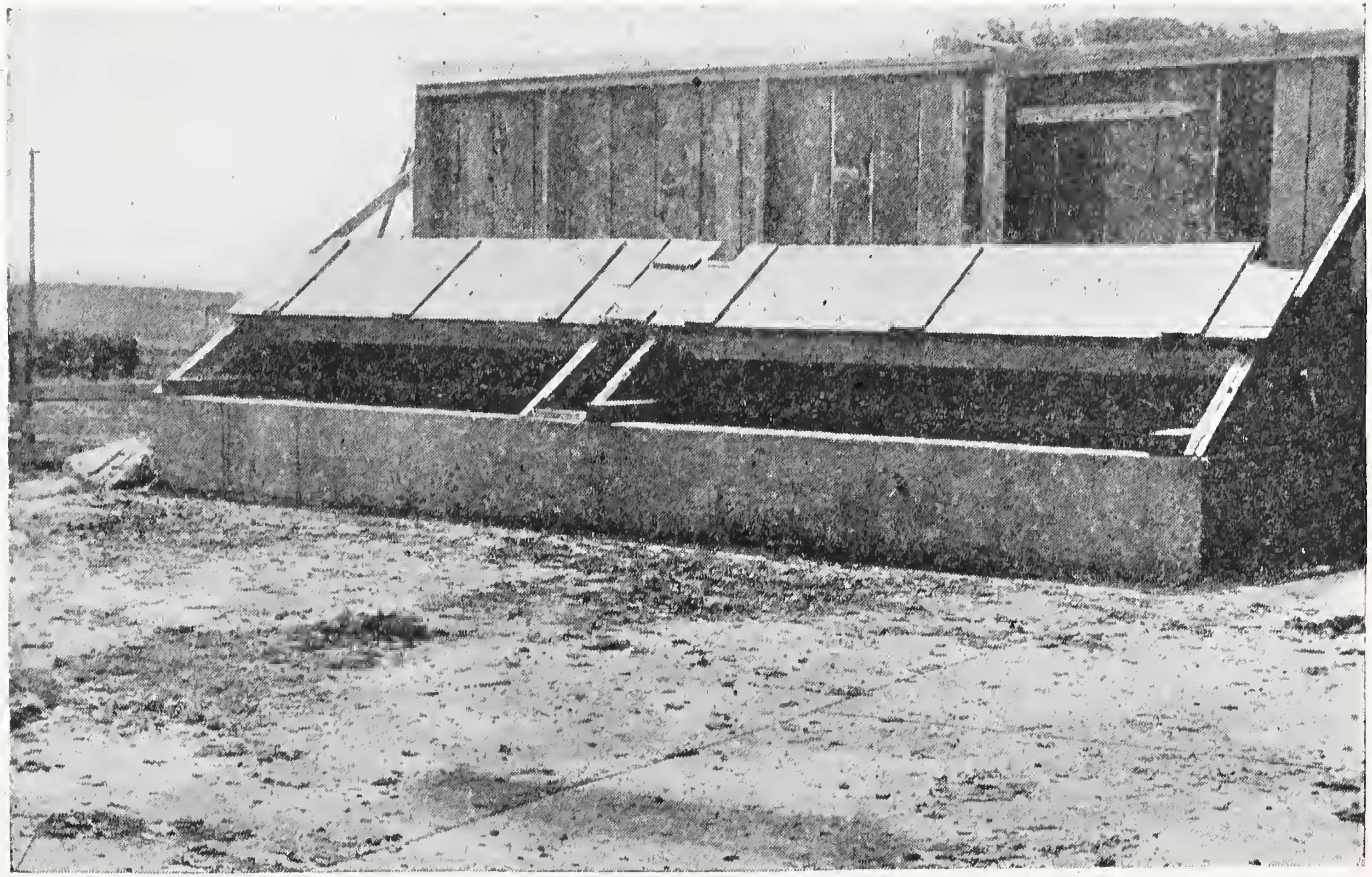


Fig. 4. Watering Trough.

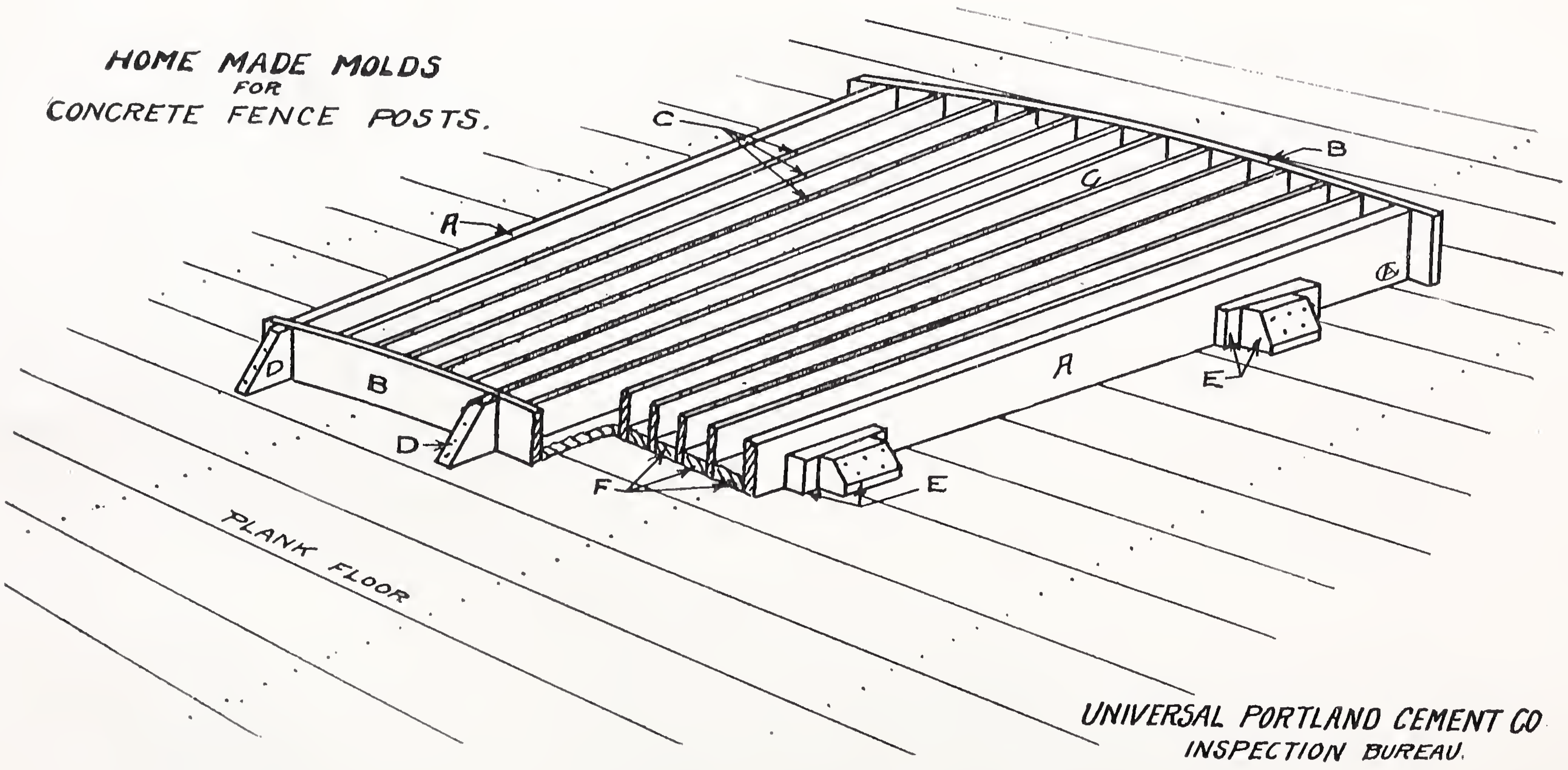


Fig. 5. Home Made Mould.

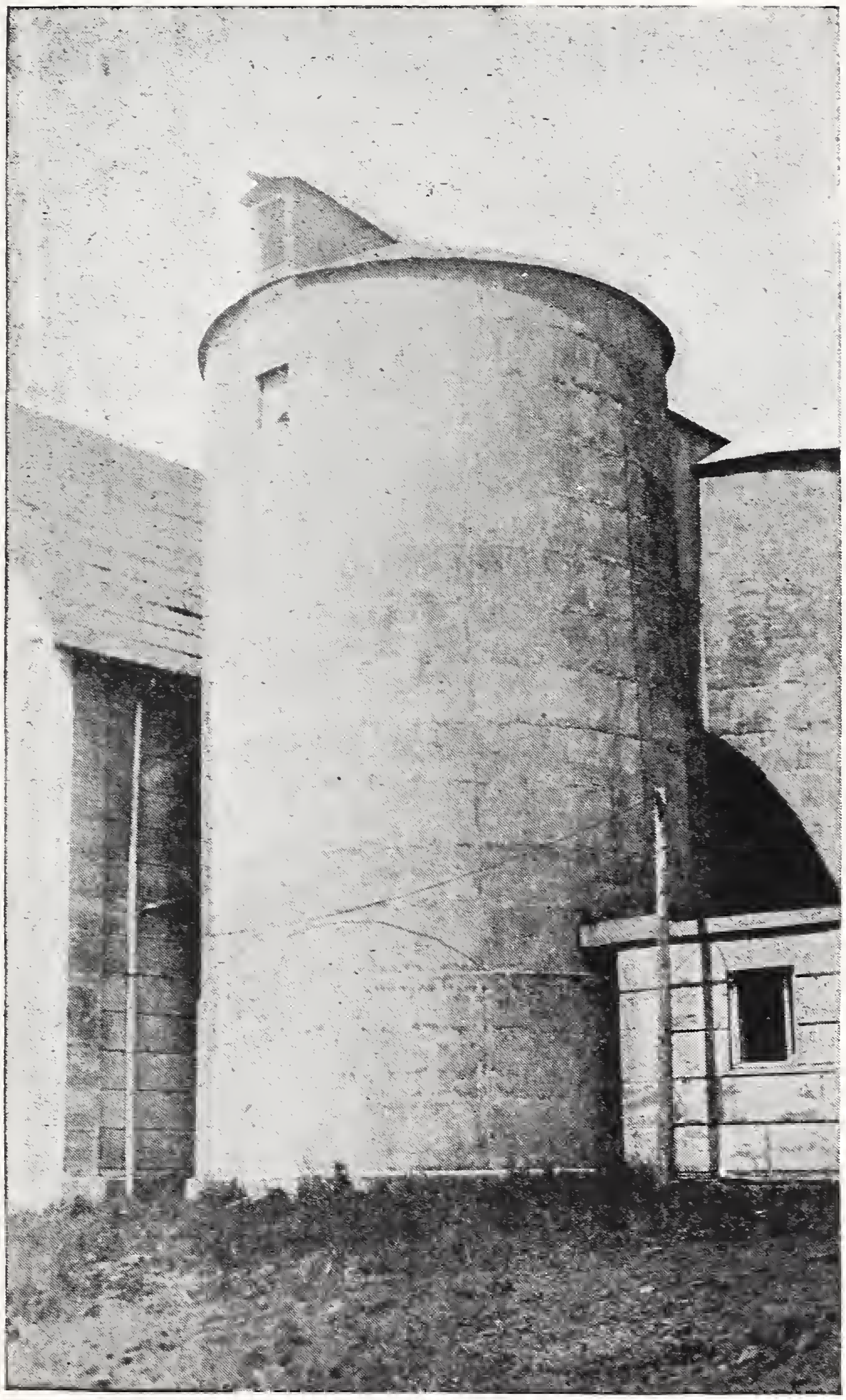


Fig. 6.—Monolithic Silo.

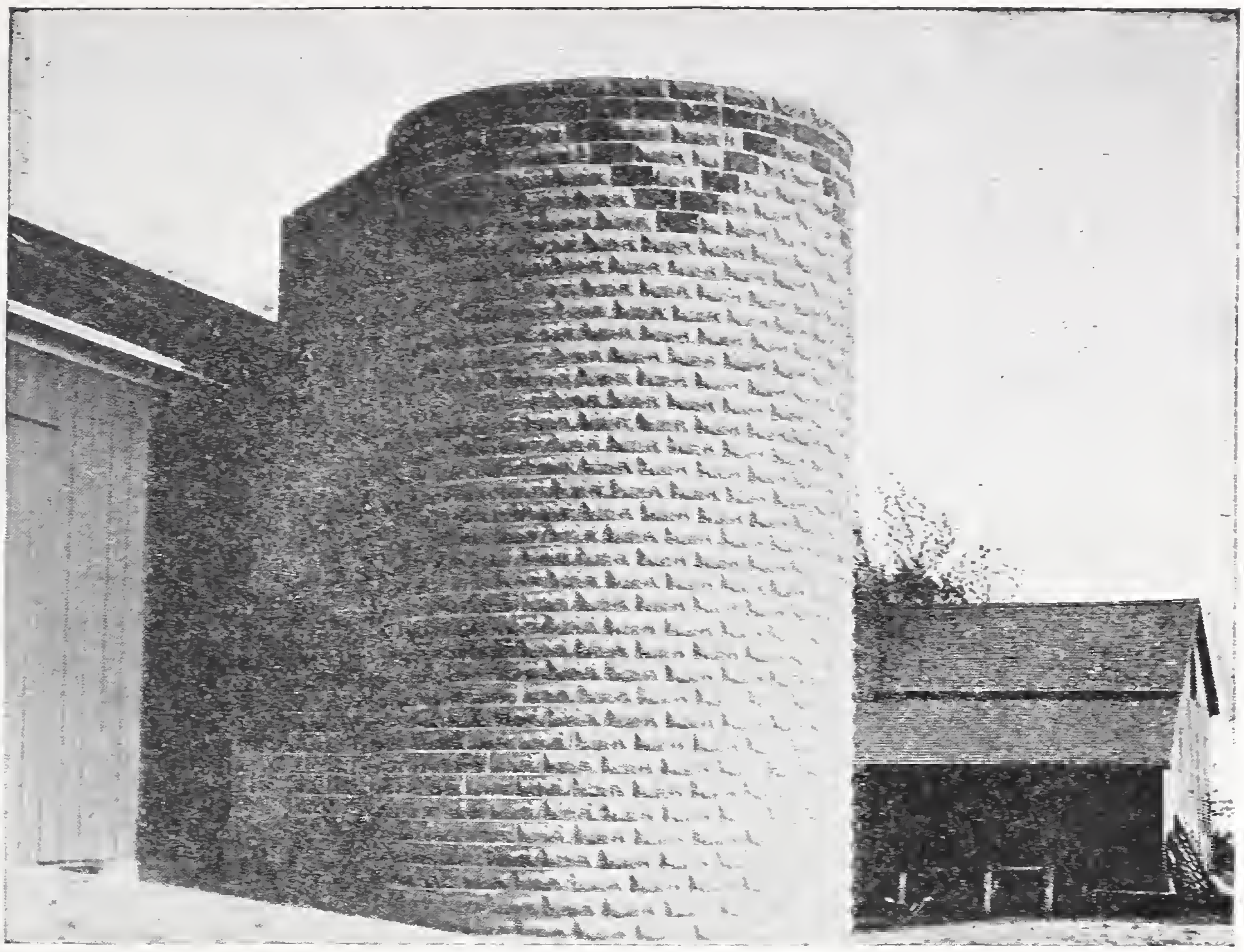


Fig. 7. Concrete Block Silo.

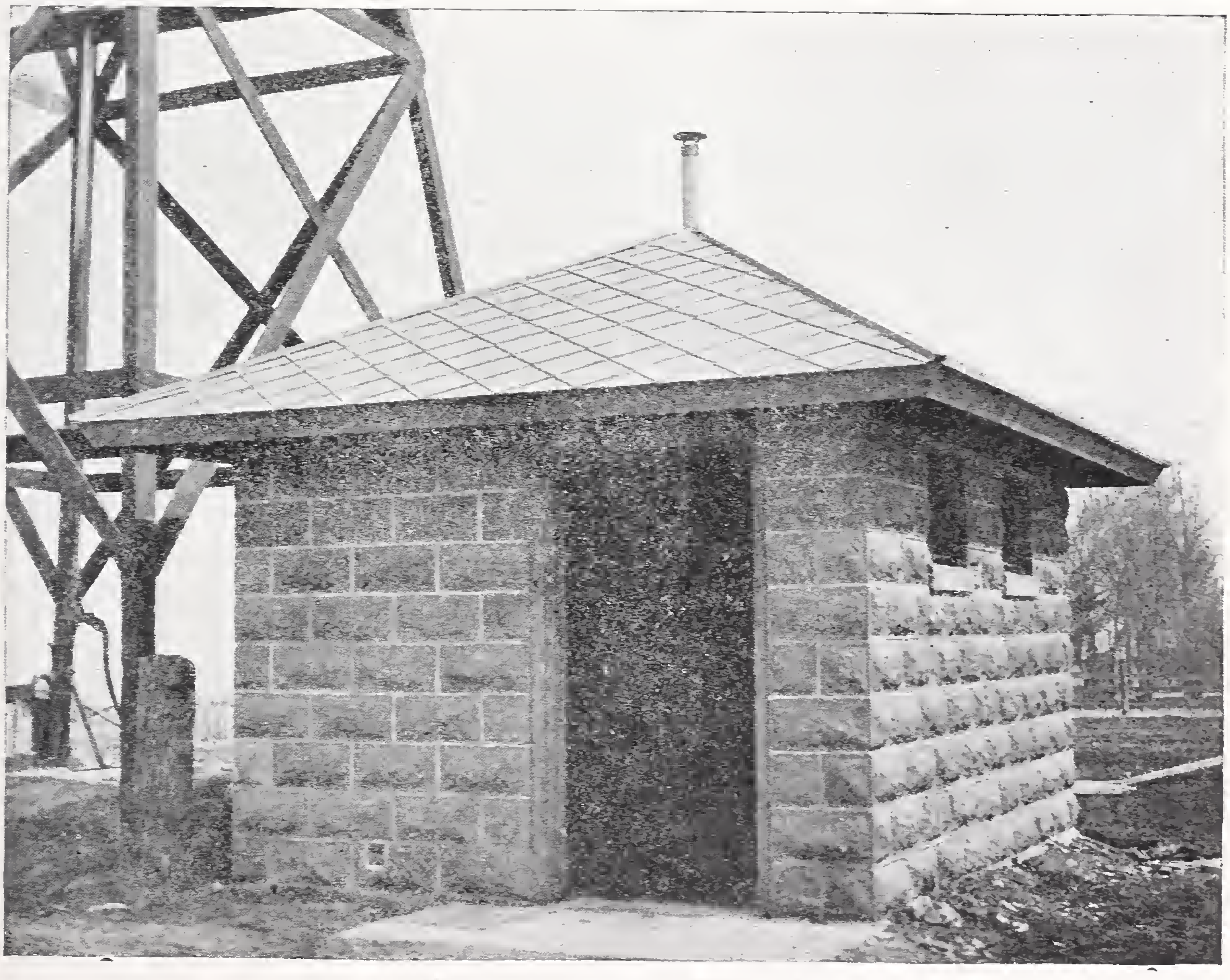


Fig. 8. Concrete Milk House.

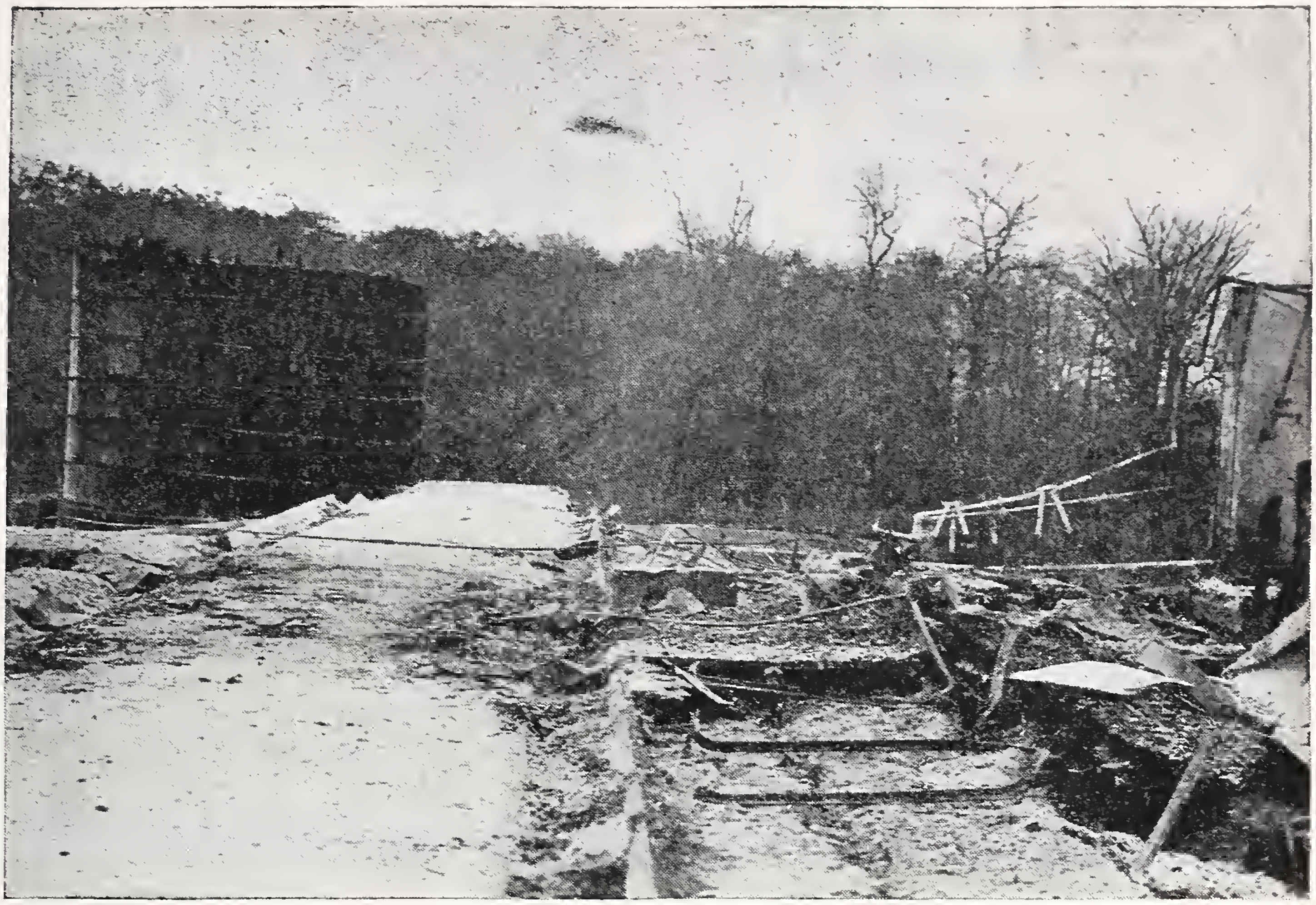


Fig. 9. Concrete for Making Fireproof Buildings.

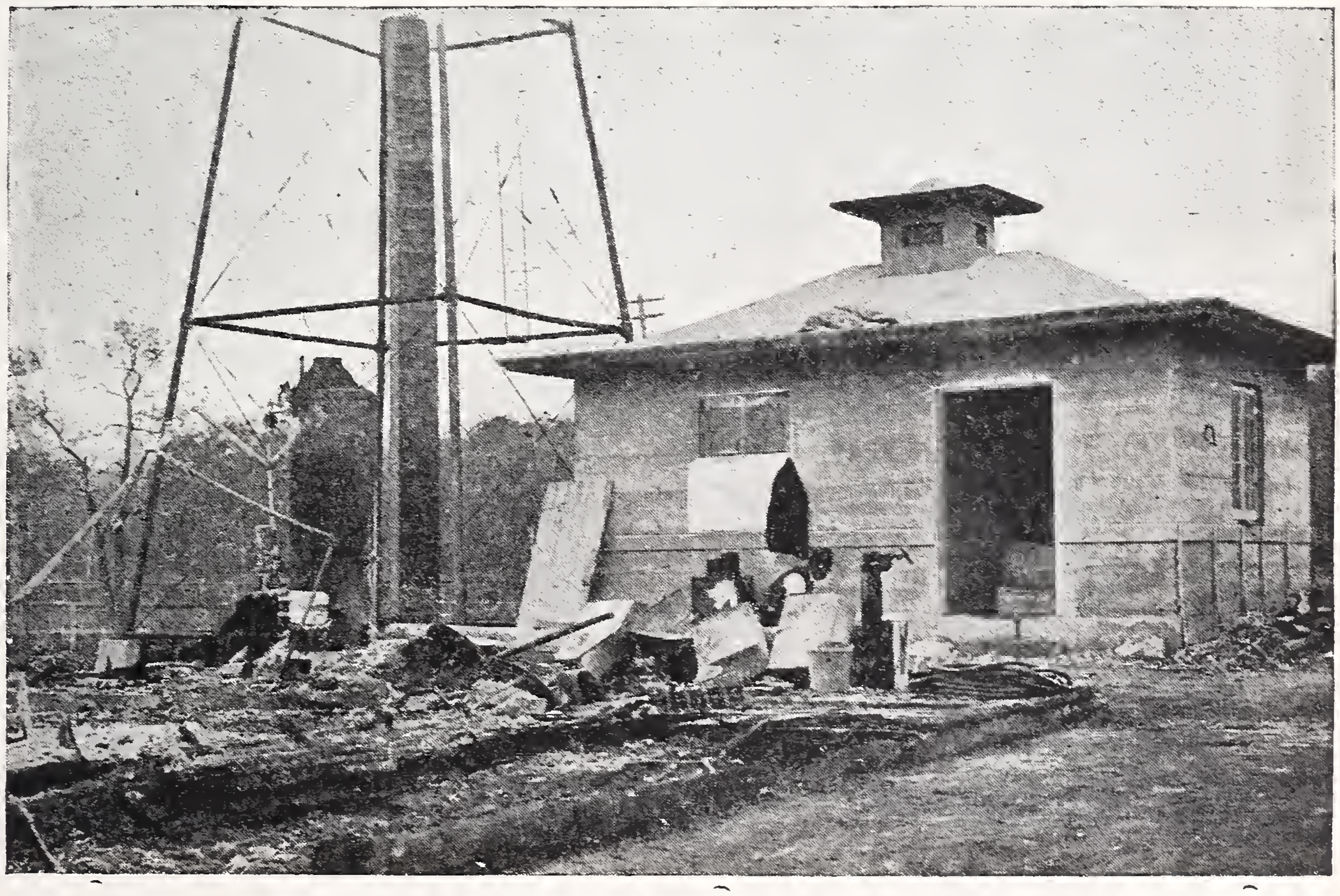
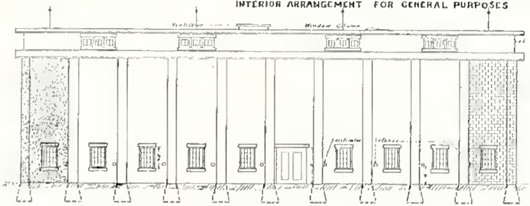
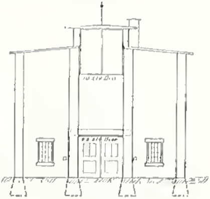


Fig. 10. Monolithic Concrete Dairy House.

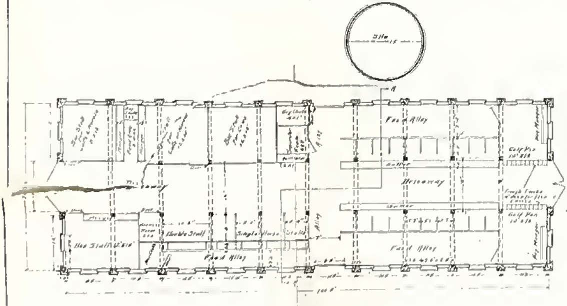
CONCRETE BARN DESIGN
For FOREST HENRY-DOVER, MINN.
INTERIOR ARRANGEMENT FOR GENERAL PURPOSES



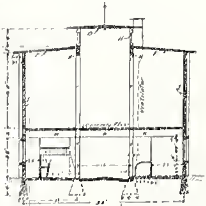
SIDE ELEVATION



END ELEVATION



PLAN



SECTION A-A

INFORMATION BUREAU
UNIVERSAL PORTLAND CEMENT CO
CHICAGO
Designed by E.S.F. Date May 15 1912
Drawn by G.L.V. Scale 1/8"-1'0"
Checked by H.C.K. Drawing No 201
Approved C.A.P.

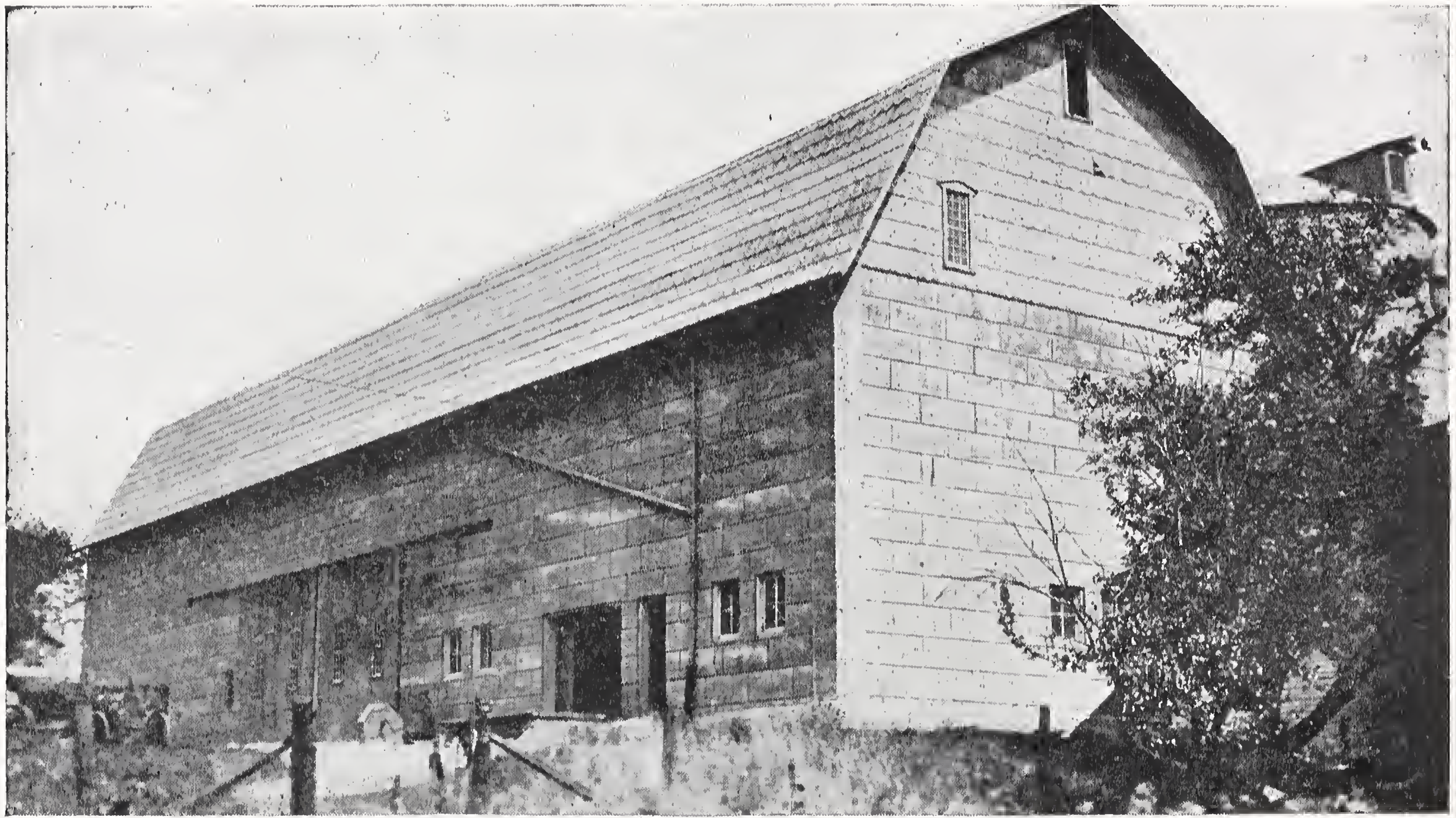


Fig. 12. Monolithic Concrete Dairy Barn.

A Member: You talk about chickens on the range not being of as good quality when it comes to meat; do they keep just as long as those that are fed in the coop?

PROF. MITCHELL: They will keep just as long but they will not be of as good quality.

The CHAIRMAN: We will now listen to the report of the Committee on Resolutions:

Prof. Menges read the following report of the Committee on Resolutions:

REPORT OF THE COMMITTEE ON RESOLUTIONS

We, the Committee on Resolutions, in order to express the appreciation of the Normal Institute for the cordial welcome and entertainment by the City of Towanda, and to recommend such action as we deem for the best interests of the Farmers Institutes and allied institutions of the State, do hereby suggest the adoption of the following resolutions:

1. *Resolved,* That we hereby express our sincere thanks for the courteous welcome extended us by the County Chairman of Farmers' Institutes, Mr. F. D. Kerrick, President Judge Maxwell of the Courts of Bradford County, President Kuykendall of the Bradford County Agricultural Society, to G. E. Frost, Burgess of Towanda, and to the Local Committee of arrangements, through whose efforts ample provision for our entertainment was made, and to the citizens of the town who have opened their homes for our comfort, and the papers of the town which have reported our proceedings, and to the Opera House Company for the use of this commodious building.

2. *Resolved,* That we extend to the Manager of Farmers' Institutes, Hon. A. L. Martin, and to the Secretary of Agriculture, our sincere thanks for the expert instruction given during the various sessions of this Normal Institute.

3. *Resolved,* That we endorse the efforts of the associations and organizations which have for their object the practical instructions and bettering of the financial and social conditions of the farmer.

4. *Resolved,* That we, the members of the State Board of Agriculture, here present, the County Managers of Farmers' Institutes and the Lecturers of Farmers Institutes, and visitors, in annual assembly gathered, do hereby request that the Legislature at its coming session appropriate $75,000 for the Farmers' Institute work for the coming two years, and that a further appropriation of $30,000 be made for practical demonstration work throughout the various counties of the State by the department of the Farmers' Institutes.

5. *Resolved.* That we request the County Chairmen or County Managers of Farmers' Institutes of the various counties of the State, that if it should be deemed necessary by the Secretary of Agriculture, or the Manager of Farmers' Institutes of this State, in order to secure the appropriations asked, for financing the var-

ious Bureaus of the Department as well as the appropriations asked for by the State College and Experiment Station, that they should, or such citizens of their counties should, come to Harrisburg to have a hearing before the appropriations committees to secure these appropriations, they shall do so.

6. *Resolved,* That we endorse the co-operative movement, and urge the members of the Normal Institute to use their influence in assisting farmers' organizations in their counties in encouraging such movements.

Respectfully submitted,

(Signed)
R. P. KESTER,
FRANKLIN MENGES,
H. M. GOODERHAM,
S. C. GEORGE,
T. J. FERGUSON.

The CHAIRMAN: What shall be done with this report?

MR. COWAN: I move it be adopted as read.

This motion was properly seconded and duly carried in the regular way.

The CHAIRMAN: The next number on the program is an address by a young man who was born on a farm in the corn belt of the Middle West; he will now talk to us on "Farm Buildings Built of Concrete," which will be illustrated with lantern slides. I now have the pleasure of introducing to you Mr. E. S. Fowler of Chicago, Ill.

Mr. Fowler spoke as follows:

FARM BUILDINGS BUILT OF CONCRETE

By E. S. FOWLER, Field Agent, Universal Portland Cement Company, Chicago, Ill.

The several speakers this week have told you how to grow better fruit, how to raise better grain, how to breed better horses, how to improve the dairy herd and how to improve the soil. After these products have been grown it is a significant fact that buildings will be needed to store and house them.

In the past most of the farm buildings have been inadequate, illy arranged, ugly and inconvenient, instead of being money savers they have been money spenders. To some extent the same condition still exists but through the science of Agricultural Engineering we may expect the solution and correction of this building waste, which will add to the profits of the farmer. It is from the standpoint of an agricultural engineer that I wish to discuss the subject assigned me this evening—"Farm Buildings Built of Concrete."

Permanent and fireproof structures are more and more demanded by farmers and why should they not demand these just as well as producers of other commodities demand them and find them economical.

High prices, poorer quality, and the scarcity of lumber are compelling the prospective builder to turn to other materials.

Concrete is a comparatively new building material which few farmers have acquired the habit of using, mainly because they do not understand it and imagine that to construct all buildings, fences, walks, floors, tanks, troughs, etc., is impracticable. The progressive farmer of today, however, is beginning to realize that concrete is the natural building material adapted to farm buildings, and for this reason he is studying its characteristics and uses.

The success of any concrete building or structure depends firstly, upon the quality of the concrete that goes into it, and secondly, upon the workmanship. A great deal has been written on how to build with concrete, but very few practical instructions have been given to the farmer on how to manufacture it. With your permission I would like to digress from the subject of this evening for a few minutes, and call your attention to the essential points of good concrete.

Concrete may be defined as an artificial stone made by mixing together cement, water and inert materials consisting of large and small particles such as sand, gravel or crushed stone. In doing this it must be remembered that the user of cement in making concrete is not only a builder, but a manufacturer, and as such he must understand the materials he is using, must exercise judgment in their selection and must handle them properly in order to obtain the best results economically.

PORTLAND CEMENT

Portland cement is a carefully manufactured compound which is sold in a condition to act immediately when mixed with water. It is usually packed in cloth or paper bags weighing ninety-five pounds each, four such bags making a barrel of three hundred and eighty pounds. Portland cement is somewhat like lime, in that it attracts moisture, and for this reason must be carefully protected when stored. If it gets damp or wet it becomes lumpy and hard. If these lumps become so hard that it is impossible to crush them easily, it has become worthless so far as a cementing material is concerned. Crushing these hard lumps to powder will not restore life to the cement, for in changing from a powder to a solid state, the same change has taken place as when cement, water and gravel or stone are mixed together, forming concrete material. As this action of hardening of cement can take place but once, it can readily be seen that the cement must be properly protected until ready for use.

AGGREGATES

The inactive materials which are mixed with cement and water to form concrete are called aggregates. The aggregates are generally divided into two classes, fine aggregate and coarse aggregate. The fine aggregate is usually referred to as that part of the material which will pass a screen having ¼ inch meshes, and generally consists of sand but may also consist of gravel or stone screenings. The coarse aggregate consists of material larger than ¼ inch, and may be gravel, crushed stone, or in fact, any hard, durable material. The aggregate must be clean, coarse, hard, durable and well graded. Clean, because if the sand grains or pieces of gravel or stone are covered with a film or coating of clay or loam, the cement cannot perform its duty in cementing the particles together. The sand should be course and well graded that is, consisting of particles ranging in size from coarse to fine, the larger sizes predominating. Such a sand is usually solid and compact, and requires a minimum amount of cement to coat the particles, and fill the voids or air spaces between them. A fine sand is sometimes used by the operator who is not entirely familiar with the proper selection of aggregate, but it requires more cement for a given strength and more thorough mixing, and therefore is not economical to use.

The aggregate should be hard and durable, hard because the concrete cannot be any stronger than the strength of the sand and stone which goes into its make-up; durable, because the sand, gravel or stone should remain hard. The size of the coarse aggregate depends largely upon the character of the work in which the concrete is to be used. It should always be such as will enable the concrete to be readily placed in the form and leave a reasonable smooth surface.

For plain concrete work, one-half the thickness of the wall of the structure is often given as the maximum size of the coarse aggregate, but for the best concrete the coarse aggregate in no case should be larger than 1½ inches.

PROPORTIONING

An ideal concrete mixture is one in which all the spaces (voids) between the pieces of gravel or crushed stone are filled with sand grains, and all the spaces between the sand grains are filled with cement. As such a mixture is hard to obtain on account of the variation in amount of voids in each load of sand or gravel, it is always better to be on the safe side and use a little more cement than required to fill the voids. From the definition of concrete we find that it is composed of water, cement, fine and coarse aggregate. Before deciding upon the relative amounts of these several materials used in making concrete, we must first consider the kind of work we intend to do. For instance, such work as tanks, silos, troughs, cisterns, etc., where solid, dense and watertight concrete and considerable strength are required, we should use about twice as much gravel or crushed stone as sand, and about twice as much sand as cement. This would be called a 1:2:4 mixture, that is to say, one part cement, two parts sand and four parts gravel or crushed stone. For ordinary work, such as foundation walls, sidewalk bases, barns or feeding floor bases, a leaner mixture could be used, say (1:2½:5), one part cement, 2½ parts sand and 5 parts gravel or crushed stone. The materials used in making concrete should always be proportioned accurately by volume and in sack batches. As one sack of cement is usually considered as one cubic foot, it will be found convenient to proportion the aggregates in a measuring box of one cubic foot capacity.

NATURAL BANK GRAVEL

Sand and screened gravel or stone, as found in natural banks, are doubtless the most popular aggregate for concrete work, as they can be obtained in nearly every locality. They are, however, rarely suitable for concrete purposes as found in their natural condition, there being too great proportion of fine aggregate. As explained above, that the most economical concrete mixture was one that contains about twice as much screened gravel or stone as sand, it is therefore, advisable to examine or test natural gravel before using, and if the proportion of sand and stone are not approximately correct. the two materials should be separated by screening, and remixed in proper proportions. In some cases it may be found cheaper to use a larger amount of cement with the material as it comes from the bank than to separate the sand and gravel, and remix in proper proportions.

MIXING

Mixing of materials for concrete work should always be done on a level, watertight platform. It will be found convenient to proportion and mix the materials in equal sized batches. This is usually taken in cement sack units, one bag of cement being considered as one cubic foot. The sand is first measured accurately by means of a measuring box, and spread in an even thin layer over the plat form. The cement is added and the two materials mixed thoroughly dry until of a uniform color, spread out again and the screened gravel or crushed stone added and again all mixed dry until of a uniform color. The mass is then shoveled up in the form of a cone and the top made cup-shape. The water is then poured into this cup-like receptacle and allowed to settle down into the mass. The entire mass is then mixed thoroughly until of a uniform wetness or consistency. If the water is applied down the sides of the pile, it is very liable to flow off, washing the cement from the particles of sand and stone.

Concrete should be deposited in its final resting place within thirty minutes after the water is added. as at this time the action of hardening begins, and if the concrete is disturbed serious results are very liable to occur.

CONSISTENCY

The wetness or consistency of the concrete when deposited in forms will depend largely upon the character of the work being done. Whenever possible, it is advisable to mix the concrete to a medium wet consistency, or one that will permit puddling or churning with a pole, thereby working the concrete thoroughly into the form. It is impossible to get a satisfactory concrete if it is mixed so dry that excessive tamping is required in order to fill the forms properly. Concrete should not be mixed with so much water that when it is deposited in the forms the stone and gravel will have a tendency to settle to the bottom, as the water will have a tendency to rise to the top and carry with it a large amount of the cement and fine particles of sand. This causes a separation of materials and if the forms are not watertight the water will flush out and carry with it the cement, and the result is a weak, lean concrete.

TOOLS AND EQUIPMENT

The tools and equipment used in the manufacture of concrete, as required by the farmer in ordinary work, are easily obtained and inexpensive. Aside from those that may be homemade the remainder are tools which are used on the farm for other purposes.

A mixing platform (Fig. 1): a sand screen (Fig. 2); measuring box (Fig. 3); a water barrel; several water buckets; wheelbarrows. at least two, and preferably of metal bodies; square shovels, one to each man.

Perhaps one of the most common ways of using cement on the farm is making concrete watering troughs. Fig 4 shows a photograph of a concrete watering trough on the farm of Mr. John Stewart, Elburn, Ill. Mr. Stewart has his entire barnyard cemented over with concrete, thus saving the most valuable part of the fertilizer for his fields. An experiment performed by the Ohio Experiment Station and reported in Bulletin No. 183, proves that a concrete floor in a yard where cattle are fatted will pay for two-thirds its cost in six months time.

Another practical application of concrete construction about the farm is found in the use of concrete posts. This includes posts for line fences, gates and corners, clothes lines, mail boxes, lamps, signs, hitching posts and vine supports. The advantages of using concrete posts in reference to any other kind are so apparent that they need scarcely be mentioned. Probably the most important consideration is their permanency, and it is no exaggeration to say that a properly made concrete post with proper usage will last forever; it will neither rot, burn or corrode. Scarcely less important than durability is the matter of cost. Fortunately concrete posts can generally be made within the cost of wooden posts and in many localities at a considerable saving.

Figure 5 illustrates a simple home made mold for making posts 7 feet long, 3 inches square at the top and 5 inches square at the bottom. This makes a tapering post which is to be greatly preferred for fastening wire fences. In fasting a wire fence to this kind of a post, tie the line wire to the post with a short piece of light wire in a manner similar to that used in fastening telephone wires to insulators. The tapering shape of the post thus prevents the wire fence from being crushed down by stock. To guard against hogs raising the fence, make notches in the corners of the posts with a chisel, so that the tie wire, will be held securely in the notches, thus preventing the line wire from being moved.

Figure 6 shows a view of two monolithic silos on the Beach Farm, Coldwater, Mich. A silo of this constructed is the more economical and durable when properly constructed than any other silo. Another type of construction is that of concrete blocks. Figure 7 shows a photograph of a concrete block silo on the farm of Mr. Fred Ludke, East Troy, Wis.

The concrete block milk house shown in Figure 8, is on the farm of Mr. A. J. Strong, Elkhorn, Wis. This building is 8 x 10 x 9 feet, inside dimensions. The roof is made of cement asbestos shingles. The total estimate cost of this structure complete is $200.00.

The value of concrete for making fireproof buildings is illustrated in Figure 9. This figure shows a view of the charred remains of Mrs. Scot Durand's Dairy Barn at Lake Bluff, Ill., which was destroyed by fire with many other frame buildings on her farm. The concrete floor in the dairy barn was the only part of this structure that escaped destruction, and the monolithic concrete dairy house (Fig. 10) shown in the rear was the only building left standing. This building remained practically unharmed. It is 14 feet x 18 feet and cost $188.00.

CONCRETE BARNS

The practice of building barns entirely of concrete is increasing from year to year because of the fact that they are the most durable, fireproof, verminproof, sanitary and economical when maintenance and lasting qualities are considered.

Figure 11 is a design of a concrete barn made for Mr. Forest Henry of Dover, Minnesota. This design can be constructed with either monolithic concrete or concrete blocks. The pilasters in the outside walls, together with the interior columns support the cross beams "B" which in turn carry the reinforced concrete haymow floor as shown in section "AA" in figure. The monitor roof "G," its walls "H" and part of roofs "F" are carried by beams "D" which are supported by columns "C." The depth of foundation depends upon the locality; it should always extend below the frost line which prevents settling due to freezing. The plan in this design shows the stock standing in stalls facing the outside wall. Points in favor of this arrangement are that it gives them plenty of light and does not require them to stand in their own shadow; this position is also an advantage with regard to ventilation. Because the fresh air coming through the intakes in the outside wall and discharging at the ceiling, falls to their faces first and is inhaled before it has a chance to mix with the foul odors of the barn. The impure air is removed from near the center of the barn through the out-take flue, extending through the haymow and exhausting into the outside air above the peak roof. Another point in favor of this plan is that it has a driveway 9 feet wide between the gutters in the cow stable part, and 12 feet wide elsewhere, extending through the entire length of the building. This makes it possible to drive through the barn, load the manure from the stables onto the manure spreader, and haul it directly to the fields, thus saving the fall strength of the barn litter for fertilizing.

The estimated bill of materials required for the construction of this barn entirely of concrete is

9764 concrete blocks.
363 cu. yds. monolithic concrete;
24885 lbs. of steel for reinforcement.

The total estimated cost of this barn, including labor for construction, would be approximately $4,800. To construct a barn similar to this with lumber it is estimated it would cost completely approximately $4,000. Further, by comparing these two costs it is found—taking into consideration the cost of maintenance, insurance against lightening and fire, and the interest on the investment—the concrete structure (because of no maintenance and insurance charges) will equal the cost of the lumber structure in five years, after this time the concrete barn will be a saving proposition.

Figure 12 shows a view of a monolithic reinforced concrete dairy barn, located on the Beach Dairy Farm, Coldwater, Mich. The walls of the barn are marked to imitate concrete blocks.

A barn built entirely with concrete will give you the most durable, fireproof, verminproof, and sanitary structure that it is possible to construct. It will give you a barn with no comparison or equal for its purpose or cost. It will give you a barn that is pleasing in architecture, yet efficient, serviceable and economical when lasting qualities are considered. The outside walls which in ordinary barns are plain and harsh in appearance, in the design above are broken and relieved by artistic pilasters stretching to the roof that makes the general perspective very attractive. Where block construction is used, blocks made of different colored aggregate may be used for decorating purposes if desired. Besides these features a concrete barn will make a warm, dry, comfortable and healthful abode for stock in winter, and the coolest structure possible in the summer. There need be no fear of blowing straw or any other dusty storage into the loft of such a barn, for neither dust on the inside nor moisture on the outside affects concrete; neither will there be the constant expense of painting and repairing as with a wooden structure, because concrete has been proven to have greater resisting properties to the elements than any other material, and its life is everlasting.

In conclusion, I believe you will agree that by a careful study of the methods of concrete construction a farmer can be his own inspector, and that with common day laborers to assist him, he can construct buildings with cement at a cost which is the same as, or even less than with lumber. This is due to the fact, as stated before, that lumber has become poorer in quality and higher in price, and that it requires higher salaried men to work it.

Program of the evening being completed the meeting was ajourned by

A. L. MARTIN,
Director of Institutes.

Commonwealth of Pennsylvania

DEPARTMENT OF AGRICULTURE

Bulletin No. 230

TABULATED ANALYSES OF COMMERCIAL FERTILIZERS

From Samples Selected in Accordance
with Act of May 1, 1909

BY THE PENNSYLVANIA DEPARTMENT
OF AGRICULTURE

From January 1 to August 1, 1912

HARRISBURG:
C. E. AUGHINBAUGH, PRINTER TO THE STATE OF PENNSYLVANIA
1912.

DEPARTMENT OF AGRICULTURE. COMMONWEALTH OF PENNSYLVANIA.

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The Act of 1st May 1909, Commonly Referred to as "The New Fertilizer Law" is as Follows:

No. 205.

AN ACT

To regulate the manufacture and sale of commercial fertilizers; prescribing penalties for its violation, and repealing an act, entitled "An act to regulate the manufacture and sale of commercial fertilizers; providing for its enforcement, and prescribing penalties for its violation," approved the twenty-fifth day of March, Anno Domini one thousand nine hundred and one.

Section 1. Be it enacted, &c., That every package of commercial fertilizer sold, offered, or exposed for sale, for manurial purposes within this Commonwealth, except the dung of domestic animals, lime, marl, and wood-ashes, shall have plainly stamped thereon the name and address of the manufacturer or importer and his place of business, the net weight of the contents of the package, the brand or trade-name of the fertilizer the package contains, and an analysis stating the percentage such fertilizer contains of nitrogen in an available form, of potash soluble in water, of soluble and reverted phosphoric acid, and of insoluble phosphoric acid.

Section 2. Every manufacturer or importer of commercial fertilizers, as specified in section one of this act, shall, on or before the first day of January of each year, or before offering them for sale in this Commonwealth, file annually with the Secretary of Agriculture a statement of the names and number of brands of such commercial fertilizers, having distinct trade-names, that he shall offer for sale during the next ensuing year, and a copy of the analysis of each one of such brands of commercial fertilizers, as required by section one of this act.

Section 3. In addition to the statement required by section two of this act, every manufacturer or importer of commercial fertilizers shall, on or before the first day of January of each year, or before offering them for sale in this Commonwealth, file annually with the Secretary of Agriculture an affidavit showing the amount of each brand of fertilizer, having a distinct trade-name, sold within the Commonwealth during the last preceding year; and if the said amount shall be one hundred tons or less, he or they shall pay or cause to be paid to the Secretary of Agriculture the sum of fifteen dollars for each and every brand of such commercial fertilizer, having a distinct trade name sold within the State during the last preceding year:

and if the said amount shall exceed one hundred tons, and be less than five hundred tons, he or they shall pay the sum of twenty dollars, as aforesaid; and if the said amount shall be five hundred tons or more, he or they shall pay the sum of thirty dollars, as aforesaid. If such manufacturer or manufacturers, importer or importers, shall not have made any sales within the Commonwealth during the preceding year, he or they shall pay the sum of fifteen dollars upon each such brand, as aforesaid: Provided, That all monies so received shall be immediately paid by the Secretary of Agriculture into the State Treasury, for the use of the Commonwealth.

Section 4. No person shall sell, offer, or expose for sale, in this State, any pulverized leather, hair, ground hoofs, horns, or wool waste, raw, steamed, roasted, or in any form, as a fertilizer, or as an ingredient of a fertilizer or manure, without an explicit statement of the fact; said statement to be conspicuously affixed to every package of such fertilizer or manure, and to accompany and go with every lot, parcel, or package of the same.

Section 5. Any person or persons selling, offering, or exposing for sale, any commercial fertilizer or any brand of the same, having a distinct trade-name, without the analysis required by section one of this act, or with an analysis stating that it contins a larger percentage of any one or more of the above-named constituents than is contained therein, or for the sale of which all the provisions of sections two and three have not been complied with, or any person violating any of the provisions of section four of this act, shall be guilty of a misdemeanor, and, on conviction, shall be sentenced to pay a fine of not less than twenty-five nor more than one hundred dollars for the first offense, and not less than two hundred dollars for each subsequent offense. It shall be the duty of the Secretary of Agriculture to enforce the provisions of this act, and all penalties, costs, and fines recovered shall be paid to him or his duly authorized agent, and by him shall be immediately paid into the State Treasury, for the use of the Commonwealth.

Section 6. The Secretary of Agriculture is hereby empowered to collect samples of commercial fertilizers, either in person or by his duly qualified agent or representative, and to have them analyzed, and to publish the results for the information of the public; and for this purpose the said Secretary of Agriculture, such assistants, agents, experts, chemists, detectives, and counsel as he shall duly authorize, shall have full access, ingress, and egress to and from all places of business, factories, barns, buildings, carriages, cars, and vessels, used in the manufacture and transportation, or sale, or any commercial fertilizer. They shall also have power to open any package or vessel containing or supposed to contain any commercial fertilizer, and take therefrom samples for analysis, upon tendering the value of said samples.

Section 7. The term "commercial fertilizers," as used in this act, shall be construed to mean any and every substance imported, manufactured, prepared, or sold for fertilizing or manuring purposes, except the dung of domestic animals, marl, lime, and wood-ashes, and not exempt by the provisions of section one of this act.

Section 8. This act shall go into effect on and after the thirty-first day of July, one thousand nine hundred and nine; and the act, entitled "An act to regulate the manufacture and sale of commercial fertilizers; providing for its enforcement, and prescribing penalties for its violation," approved the twenty-fifth day of March, Anno Domini one thousand nine hundred and one, is hereby repealed.

Approved—The 1st day of May, A. D. 1909.

EDWIN S. STUART

No. 95.

AN ACT

Making it unlawful for any person, firm, or corporation, engaged in the manufacture or sale of commercial fertilizers, to use the word "bone" in connection with, or as part of the name of, any fertilizer, or any brand of the same, unless the phosphoric acid contained in such fertilizer shall be the product of pure animal bone; and providing a penalty for violation of the same.

Section 1. Be it enacted, &c., That it shall be unlawful for any person, firm or corporation, engaged in the manufacture or sale of commercial fertilizers, to use the word "bone" in connection with, or as part of the name of, any fertilizer, or any brand of the same, unless the phosphoric acid contained in such fertilizer shall be the product of pure animal bone.

Section 2. Any person or persons violating the provisions of this act shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall pay a fine of fifty dollars for the first offense, and a fine of not less than one hundred dollars, nor more than two hundred dollars, for every subsequent offense; such fine or fines to be paid into the State Treasury, for the use of the Commonwealth. The Secretary of Agriculture shall, together with his deputies, agents, and assistants, be charged with the enforcement of this act.

Section 3. All magistrates, aldermen, and justices of the peace throughout this Commonwealth shall have jurisdiction to hear and determine actions arising from violations of the provisions of this act, and shall have authority to hold for court, or to impose the penalty hereby prescribed, subject to appeal, as the law shall direct.

Section 4. This act shall go into effect on the first day of January, Anno Domini nineteen hundred and ten.

Approved—The 23d day of April, A. D. 1909.

EDWIN S. STUART.

State College, Pa., *July 18, 1912.*

Hon. N. B. Critchfield, *Secretary of Agriculture, Harrisburg, Pa.:*

Dear Sir: I have the honor to transmit herewith my report upon the analyses of the samples of commercial fertilizers received from official sampling agents during the spring season of 1912.

Very respectfully,

WM. FREAR,

Vice-Director and Chemist.

The Penna. State College Agricultural Experiment Station.

FERTILIZER VALUATIONS.

The object of an official valuation of commercial fertilizers is to enable the consumer to judge approximately whether he has been asked to pay for a given brand more than the fertilizing ingredients it contains and market conditions prevailing at the time would warrant. It is clear, therefore, that no attempt is made in this valuation to indicate whether the fertilizer valued possesses a greater or less crop-producing capacity than another fertilizer; but only whether it is higher priced than another of the same general composition.

For this purpose the valuation must be so computed as to include all the elements entering into the cost of a fertilizer as it is delivered to the consumer. These elements may conveniently be grouped as follows:

1. The wholesale cost of the ingredients.
2. The jobbers' gross profit on the sale of the ingredients; this includes office expenses, advertising, losses, etc.; for the purpose of the present computation it may be assumed that the sum of this gross profit and the wholesale cost of the ingredients, is equivalent to the retail price of the single ingredients near the wholesale markets in ton lots of original packages for cash.
3. The expense and profit of mixing: This item applies only to complete fertilizers, rock and potash, and ammoniated rock; not to dissolved or ground bone, or to dissolved rock.
4. The expense and profit of bagging.
5. Agents' commission: This item includes not only the commission proper, but every advance in price due to the sale of the goods through an agent in small quantities on time, rather than directly to the consumer in ton lots for cash.
6. Freight from the wholesale market to the point of delivery.

The valuations for 1912 were based:

1. Upon the wholesale prices from September 1, 1911; to March 1, 1912, of the raw materials used in fertilizer manufacture, the quotations of the New York market being adopted for all materials except acidulated phosphate rock and ground bone.
2. Upon an allowance of 20 per cent. of the wholesale prices, above mentioned, to cover jobbers' gross profit.

By adding the 20 per cent. allowed for jobbers' gross profit to the wholesale price of the several raw materials, the retail price in original packages at the jobbers' warehouse is obtained.

Since the amount of the several valuable fertilizing constituents in the various raw materials is known, it is a simple matter to determine the corresponding retail value per pound of the valuable fertilizing constituents yielded by each raw material. A schedule of these pound values affords a convenient basis of computation of the value per ton of various fertilizers, whose composition is ascertained by analysis.

The values assigned, for the present, to the other elements in the cost of the fertilizer at the point of delivery are:

3. For mixing, $1.00 per ton.

4. For bagging, $1.00 per ton, in all cases except those in which the article was sold in original packages; the cost of the package being, in such cases, included in the wholesale price.

5. For agents' commission, 20 per cent. of the cost of the goods f. o. b. at the jobbers' or mixers' warehouse.

6. For freight, $2.00 per ton; the cost of the freight in lots of twelve tons or over, from the seaboard to Harrisburg, averaging $1.88 per ton.

The following valuation of dissolved South Carolina rock illustrates the method:

Phosphoric Acid.	%	Weight per ton.	
Available,	14.00	280 lbs. at 3c,	$8.40
Insoluble,	1.00	20 lbs. at 1½c,	.30
Retail cash value of ingredients,			8.70
Bagging,			1.00
Cash value of goods ready for shipment,			9.70
Agents' commission, 20 per cent.,			1.94
Freight,			2.00
Commercial value per ton,			$13.64

It is not to be expected, of course, that the valuations thus computed will precisely represent the fair price to be charged for a brand in each locality and in every transaction. Market conditions, competition, distance from factory, all introduce minor variations. Nevertheless, to make the approximation reasonably close the average valuation of a given class of goods ought to agree closely with its ascertained average selling price. Whenever such an agreement is no longer obtained by the use of a schedule, it is evident that the schedule of retail values of the constituents, or the added allowances for mixing, etc., requires revision.

It is needful to note here another factor greatly affecting the practical accuracy of these approximations. Their computation would offer little difficulty and their usefulness be far greater, if, by the ordinary methods of analysis, the exact nature of the ingredients used to supply the several fertilizer constituents, were capable of certain determination. This is, however, possible to-day to only a limited extent. The valuations are therefore based on the assumption that the fertilizers are uniformly compounded from high quality ingredients, such as are commonly employed in the manufacture of fertilizers of the several classes. Consumers should carefully avoid the error of accepting such valuations as infallible; they are not designed to be used for close comparisons of single brands, but only to indicate whether the price asked for a fertilizer is abnormal, assuming good quality for the ingredients used. From this it is clear that, *except as high freights may require, the selling price of a brand should not far exceed the valuation; but that a fertilizer may be made of inferior materials and yet have a high valuation.*

The valuations used during 1911 were modified for use during 1912 in accordance with the changes in wholesale prices of fertilizing ingredients and to make the valuations more closely follow the selling price.

The following comparative statement shows the valuations and selling prices of the several classes of fertilizers during 1907 to 1911.

Fertilizers.	Number of samples.	Valuation.	Selling price.	Difference of valuation from selling price.
Spring, 1907.				
Complete,	424	26,84	24.60	2.24
Rock-and-potash,	103	16.63	16.94	—.31
Dissolved bone,	6	25.08	22.28	2.80
Ground bone,	27	29.64	31.55	—1.91
Dissolved rock,	41	14.72	14.64	.08
Fall, 1907.				
Complete,	280	24.59	22.71	1.88
Rock-and-potash,	96	15.82	16.58	—.76
Dissolved bone,	8	27.61	22.09	5.52
Ground bone,	36	28.80	28.92	.12
Dissolved rock,	48	14.67	14.76	.09
Spring, 1908.				
Complete,	455	26.23	25.69	.54
Rock-and-potash,	108	16.24	16.96	—.62
Dissolved bone,	4	23.09	21.11	1.98
Ground bone,	21	28.96	29.04	—.08
Dissolved rock,	33	14.92	14.72	.20
Fall, 1908.				
Complete,	287	23.88	22.34	1.54
Rock-and-potash,	104	16.17	16.43	—.26
Dissolved bone,	6	26.05	22.48	3.57
Ground bone,	30	27.90	29.18	—1.28
Dissolved rock,	49	14.86	14.31	.55

Fertilizers.	Number of samples.	Valuation.	Selling price.	Difference of valuation from selling price.
Spring, 1909.				
Complete,	426	25.31	24.88	—.43
Rock-and-potash,	111	15.94	16.98	—1.40
Dissolved bone,	8	21.57	22.25	—.68
Ground bone,	24	30.28	30.70	—.42
Dissolved rock,	33	13.62	14.76	—1.14
Fall, 1909.				
Complete,	255	22.25	22.07	.14
Rock-and-potash,	92	15.50	16.10	—.60
Dissolved bone,	3	22.85	24.50	—1.65
Ground bone,	26	28.71	29.39	—.68
Dissolved rock,	41	14.02	13.86	.16
Spring, 1910.				
Complete,	436	26.63	25.26	1.37
Rock-and-potash,	123	16.08	17.16	—1.08
Dissolved bone,	8	21.47	22.17	—.70
Ground bone,	24	30.27	30.19	.08
Dissolved rock,	47	14.00	14.56	—.56
Fall, 1910.				
Complete,	294	22.24	21.76	.48
Rock-and-potash,	109	16.34	16.38	—.04
Dissolved bone,	4	25.70	25.80	—.10
Ground bone,	29	31.10	29.98	1.12
Dissolved rock,	32	14.15	14.01	.14
Spring, 1911.				
Complete,	485	25.95	24.97	.98
Rock-and-potash,	129	15.99	17.05	—1.06
Dissolved bone,	6	23.82	20.33	3.37
Ground bone,	23	31.47	30.93	.54
Dissolved rock,	51	14.86	15.83	—1.58
Fall, 1911.				
Complete,	292	22.33	21.73	.61
Rock-and-potash,	129	16.07	16.25	—.18
Dissolved bone,	3	21.51	24.88	—3.37
Ground bone,	25	31.18	31.17	.01
Dissolved rock,	42	13.78	14.00	.22

The following statement from the weekly reports of the Oil, Paint and Drug Reporter, of New York City, shows the average wholesale prices of fertilizer raw materials from September 1, 1910, to March 1, 1911, and from September 1, 1911, to March 1, 1912.

Wholesale Prices of Fertilizer Ingredients, New York, Oil Paint and Drug Reporter.

Substance.	Amount priced.	Average price Sept. 1, 1910, to March 1, 1911.	Average price Sept. 1, 1911, to March 1, 1912.	Prices Sept.-March, 1911-1912, in per cent. of price 1910-1911.
Sulphate of ammonia,	Cwt.,	2.945	3.196	108.5
Nitrate of soda,	Cwt.,	2.1236	2.224	104.9
Dried blood, H. G.,	Unit (20 lbs.),	3.295	3.019	91.6
Concentrated tankage,	Unit (20 lbs.),	2.78	2.542	91.1
Rough bone,	Ton,	21.50	23.12	107.5
Bone meal,	Ton,	23.25	24.12	103.2
Fish guano, dry,	Unit (20 lbs.),	3.073	3.228	108.3
Phosphate rock, Tenn.,	Ton,	5.25	5.25	100.0
Acid phosphate,	Unit (20 lbs.),	.635	.525	82.8
Double manure salt,	Ton,	22.75	24.66	108.4
Sulphate of potash,	Ton,	43.50	46.58	107.1
Kainit,	Ton,	7.50	8.333	111.1
Muriate of potash,	Ton,	35.75	38.18	106.4
Sulphuric acid, 66 degrees B.,	Cwt.,	1.05	1.05	100.0

In ammoniates such as dried blood and fish guano, the unit is of ammonia, of which 82.25 per cent. is nitrogen; in acid phosphate the unit is of phosphoric acid (phosphorus pentoxid).

There has been a slight decrease in price in some of the organic ammoniates, due probably to the record cotton crop in the South, and the increased demand for sulphate of ammonia and nitrate of soda, both of which increased slightly in price.

Acid phosphate is lower, while phosphate rock and sulphuric acid show no change in price compared with last year, the price per short ton having remained constant throughout the year at $5.25 for Tennessee phosphate.

Potash Salts: The New York Oil Paint and Drug Reporter gives the following imports of potash salts for the years 1910 and 1911, which show constantly increasing consumption.

	1910	1911
Muriate of potash,	381,873,875	509,254,846
Sulphate of potash,	86,162,874	121,039,192
Kainit and manure salt,	377,778	737,852

A compromise has at last been reached in the much mooted "Potash Controversy," the American holders having relinquished their old contracts and entered into new ones with German Syndicate which is more firmly entrenched than ever. The price of potash salts have increased sightly.

Composition of Raw Materials.—In order to form a correct idea of the cost per pound of the fertilizer constituents of these materials, it is needful to determine their composition or, in other words, the quantities of valuable constituents each contains. The following table shows the composition of the raw materials used in the manufacture of fertilizers. Few analyses of these materials, with the exception of ground bone and dissolved rock, have been made in Pennsylvania. The figures in the following table include the averages of the results of analyses made in Connecticut, New Jersey and Massachusetts during the past year, except in the case of ground bone and dissolved rock phosphates, where Pennsylvania results alone are included.

Composition of Non-Acidulated Fertilizer Ingredients. (Per Cent.)

Substance.	Number of samples analyzed.	Nitrogen.	Potash.	Total phosphoric acid.
Sulphate of ammonia,	11	20.07	----------	----------
Nitrate of soda,	13	15.42	----------	----------
Dried blood,	18	11.35	----------	----------
Ground bone,	25	3.20	----------	21.05
Tankage,	28	6.33	----------	11 60
Ground fish,	10	8.48	----------	7.06
Cottonseed meal,	273	6.97	----------	----------
Castor pomace,	8	4.96	----------	----------
Sulphate of potash,	5	----------	50.24	----------
Muriate of potash,	16	----------	50.61	----------
Kainit,	9	----------	13.53	----------
Double sulphate of potash and magnesia,	3	----------	27.66	----------

Composition of Acidulated Fertilizer Ingredients (Per Cent.)

	Number of samples.	Total phosphoric acid.	Insoluble phosphoric acid.	Nitrogen.
Dissolved bone,	3	12.10	1.70	1.90
Dissolved phosphate rock,	41	15.49	1.18	----------

Cost per Pound of Fertilizer Constituents.—With the composition of these raw materials and their price per ton, hundred weight, or other unit of measure as a basis, the wholesale cost per pound of the valuable constituents can readily be calculated. In many cases the ammoniates are quoted "per unit of ammonia," the term unit being equivalent to per cent.; in goods sold by the ton of 2,000 lbs., the unit is equal to 20 lbs., and 20 lbs. of ammonia contain 16,47 lbs. of nitrogen.

In the case of refuse bone-back, unacidulated, the mean, 28.25 per cent. of phosphoric acid, is assumed to represent the average material on the market.

Phosphate rock is sold by the ton of 2,240 lbs., and on the basis of the bone phosphate of lime it contains, with drawbacks for injurious constituents. Bone-phosphate of lime contains 45.8 per cent. of phosphoric acid; therefore, each per cent .of bone phosphate in a long ton is equivalent to 22.4 lbs., and contains 10.26 lbs. of phosphoric acid.

In the wholesale trade, dried blood, azotine, concentrated tankage and hoof meals are usually sold on the basis of ammonia, disregarding the phosphoric acid present.

Insoluble phosphoric acid in dissolved rock is likewise omitted from consideration, contracts, being based solely upon the "available" phosphoric acid; nor in rock phosphates is any claim made for the small quantities of nitrogen and potash they contain, nor in dissolved bone for the potash present.

Under these conditions, the wholesale cost per pound in New York of the valuable constiteuents of such materials as furnish but a single fertilizing element, these materials being assumed to be in the state of preparation and in the packing in which the manufacturer purchased them, are given in the following table; also a figure representing a fair retail price at the factory, the materials having undergone no change in treatment or packing and the allowance for expenses and profit in retailing being 20 per cent.

Wholesale Cost per Pound of Fertilizing Constituents, New York.

I. Ingredients Supplying One Constituent.

Materials.	Constituent Valued.	Wholesale price, cents.	Wholesale price plus 20 per cent., cents.
Sulphate of ammonia,	Nitrogen,	15.98	19.18
Nitrate of soda,	Nitrogen,	14.42	17.30
Dried blood,	Nitrogen,	18.35	22.02
Concentrated tankage,	Nitrogen,	15.45	18.54
Phosphate rock, Tenn., 78 per cent.,	Phosphoric acid, total,*	.73	.88
Acid phosphate,	Phosphoric acid, available,	2.63	3.16
Double sulphate of potash and magnesia,	Potash,	4.45	5.34
Sulphate of potash,	Potash,	4.63	5.55
Kainit,	Potash,	3.07	3.68
Muriate of potash,	Potash,	3.77	4.52

*The prices of phosphate rock are f. o. b. at the respective points of shipment, not New York. The prices for potash are taken from the schedule of the syndicate, and those of the remainder from the Oil, Paint and Drug Reporter.

The quotations for bone are given without specific reference to quality, so that it is impossible, from these data, fairly to apportion their several wholesale values to the nitrogen and phosphoric acid contained in this material. As compared with tankage, the general tendency is to assign a higher commercial rating to the phosphoric acid in bone, and to nitrogen, a rating not very different from that given in tankage.

In former years, the value assigned to the nitrogen has been the same as that quoted on crushed tankage, c. a. f. Baltimore. In later years, quotations for both crushed tankage and ground tankage have not been available, and for that reason, the value of nitrogen is based upon the quotations for concentrated tankage.

In earlier years, quotations on ground tankage have been about 5 per cent. in advance of those on concentrated tankage, also quotations on crushed tankage were on an average 12.67 per cent. in advance of these on ground tankage. Increasing the price of concentrated tankage by these percentages we have $3.00 per unit of ammonia as the value assigned to the nitrogen in bone.

This is equivalent to $3.65 per unit of nitrogen.

The average composition of the ground bone and bone meal samples analyzed last fall in Pennsylvania was: Phosphoric acid, 21.05 per cent.; nitrogen 3.20 per cent.

The prepared bone contains less fat and moisture, and often less nitrogen than the ordinary rough bone, but these differences tend, in a measure, to neutralize each other. Assuming for the rough bone quoted in the New York market the same composition as the bone meal sold in Pennsylvania, and for the value of the nitrogen $3.65 per unit, as previously stated, the values per pound of the several constituents would be:

Wholesale Cost per Pound of Fertilizer Constituents, New York.

II. BONE.

Materials	Constituent Valued.	Wholesale price, cents.	Wholesale price plus 20 pr cent.
Rough bone,	Nitrogen,	18.25	21.90
	Phosphoric acid,	2.71	3.25
Ground bone,	Nitrogen,	18.98	22.77
	Phosphoric acid,	2.82	3.38

Valuation in Neighboring States.

It is desirable, from all points of view, that the schedules of valuation throughout a district in which similar market conditions prevail, should differ as little as possible. It has been our practice in the past, to conform our schedule to that adopted after very careful co-operative study of market conditions for each year, by the New England States, New York and New Jersey, except where the peculiar conditions of our markets have made the valuations diverge too largely from the actual selling prices, as in the case of ground bone and dissolved rock phosphates. The schedules for these States for 1911 and 1912 are as follows:

Trade Values Adopted by the New England States and New Jersey.

	Cents per Pound.		Values in 1912 in per cent. of those in 1911.
	1911.	1912.	
Nitrogen:			
In nitrates,	16	16½	103.1
In ammonium salts,	16	16½	103.1
In dry and fine ground fish and blood,	23	22	95.7
In fine bone and tankage and mixed fertilizers,	20	19	95.0
In coarse bone and tankage,	15	15	100.0
Phosphoric acid:			
Water soluble,	4⅓	4⅓	100.0
Citrate soluble,	4	4	100.0
In fine ground bone and tankage,	4	4	100.0
In coarse bone and tankage,	3½	3½	100.0
In mixed fertilizers, insoluble,	2	2	100.0
Potash:			
In forms free from muriate,	5	5¼	105.0
As muriate,	4¼	4¼	100.0

Valuations in Pennsylvania.

For reasons stated on the previous page, the New England schedule has been followed in the case of mixed fertilizers and dissolved bones.

In the case of the dissolved rocks, the wholesale prices of raw materials used in their manufacture and of the available phosphoric acid itself, having shown no material change, the values used in the Pennsylvania schedule for 1911 were continued for use during the present year.

The entire schedule adopted for use in this State is presented in the following table:

Pennsylvania Schedule of Values for Fertilizer Ingredients, 1912.

	Cents per Pound.
Nitrogen:	
In ammonia salts,	16½
In nitrates,	16½
In meat, dried blood and mixed fertilizers,	19
In fine ground bone and tankage,	18
In coarse bone and tankage,	15
Phosphoric acid:	
Available, in bone fertilizers,	4¼
Available, in rock fertilizers,	3
Insoluble in ammonium citrate, in bone fertilizers,	2
Insoluble in ammonium citrate, in rock fertilizers,	1½
In fine bone, tankage and fish,	3¾
In coarse bone and tankage,	2¾
In cottonseed meal, castor pomace and wood ashes,	3½
Potash:	
In high grade sulphate or forms free from muriate,	5½
As muriate,	4¼

Potash in excess of that equivalent to the chlorin present, will be valued as sulphate, and the remainder as muriate.

In certain cases where specific claim is made by the manufacturer that potash has been added as carbonate, potash in excess of that equivalent to soluble chlorides and soluble sulphates will be valued as carbonate.

Nitrogen in mixed fertilizers will be valued as derived from the best sources of organic nitrogen, unless clear evidence to the contrary is obtained.

Phosphoric acid in mixed fertilizers is valued at bone phosphoric acid prices, unless clearly found to be derived from rock phosphate.

Bone is sifted into two grades of fineness: Fine, less than 1-50 inch in diameter; coarse, over 1-50 inch in diameter.

The result obtained by the use of this schedule does not cover the items of mixing, bagging, freight and agents' commission. To cover these, allowances are made as follows:

For freight, an allowance of $2.00 per ton on all fertilizers.

For bagging, an allowance of $1.00 per ton on all fertilizers, except when sold in original packages.

For mixing, an allowance of $1.00 per ton on complete fertilizers and rock-and-potash goods.

For agents' commission, an allowance of 20 per cent. is added to the cash value of the goods ready for shipment.

FERTILIZER ANALYSES JANUARY 1 TO AUGUST 1, 1912.

Since January 1, 1912, there have been received from authorized sampling agents two thousand and thirty-four fertilizer samples, of which seven hundred and fifteen were subjected to analysis. Preference is given to those which have not been recently analyzed. In cases where two or more samples representing the same brand were received, equal portions from several samples were united, and the composite sample was subjected to analysis.

The samples analyzed group themselves as follows: 470 complete fertilizers, furnishing phosphoric acid, potash and nitrogen; 4 dissolved bones, furnishing phosphoric acid and nitrogen; 137 rock-and potash fertilizers, furnishing phosphoric acid and potash; 43 acidulated rock phosphates, furnishing phosphoric acid only; 24 ground bones, furnishing phosphoric acid and nitrogen, and 37 miscellaneous samples, which group includes substances not properly classified under the foregoing heads.

The determinations to which a complete fertilizer is subjected are as follows: (1) Moisture, useful for the comparison of analyses, for indication of dry condition and fitness for drilling, and also of the conditions under which the fertilizer was kept in the warehouse. (2) Phosphoric acid—total and insoluble; that is, that portion not soluble in water nor in warm ammonium citrate solution (a solution supposed to represent the action of plant roots upon the fertilizer), which is assumed to have little immediate food value. By difference, it is easy to compute the so-called "available" phosphoric acid. (3) Potash soluble in water—most of that present in green sand marl and crushed minerals, and even some of that present in vegetable materials such as cotton-seed meal, not being included because insoluble in water even after long boiling. (4) Nitrogen—This element is determined by a method which simply accounts for all present, without distinguishing between the quantities present in the several forms of ammonium salts, nitrates or organic matter. (5) Chlorin—this determination is made to afford a basis for estimating the proportion of the potash that is present as chlorid or muriate, the cheaper source. The computation is made on the assumption that the chlorin present, unless in excess, has been introduced in the form of muriate of potash; but doubtless there are occasional exceptions to this rule. One part of chlorin combines with 1.326 parts of potash to form the pure muriate; knowing the chlorin, it is, therefore, easy to compute the potash equivalent thereto. (7) In the case of ground bone, the state of sub-division is determined by sifting through accurately made sieves; the cost of preparation and especially the promptness of action of bone in the soil depend very largely on the fineness of its particles, the finer being much more quickly useful to the plant.

The preceding paragraph sets forth the nature of the examinations given to the several classes of fertilizers under the laws in force prior to the present year. The legislation of 1909 has made needful, however, some additional tests. Section 4, of the Act of May 1, 1909, prohibits the sale of "pulverized leather, hair, ground hoof, horns, or wool waste, raw, steamed, roasted, or in any form, as a fertilizer, or as an ingredient of a fertilizer or manure, without an explicit statement of the fact." All nitrogenous fertilizers have, therefore, been submitted to a careful microscopic examination, at the time of preparing the sample for analysis, to detect the presence of the tissues characteristic of the several materials above named. The act of April 23, 1909, makes it unlawful to use the word "bone" in connection with, or as part of the name of any fertilizer, or any brand of the same, unless the phosphoric acid contained in such fertilizer shall be the product of pure animal bone. All fertilizers in whose name the word "bone" appears, were therefore examined by microscopic and chemical methods to determine, so far as possible with present knowledge, the nature of the ingredient or ingredients supplying the phosphoric acid. It is a fact, however, well known to fertilizer manufacturers and which should be equally understood by the consumer, that it is, in certain cases, practically impossible to determine the source of the phosphoric acid by an examination of the finished fertilizer. The microscope shows clearly the structure of raw bone, but does not make it possible to discriminate between thoroughly acidulated bone and acidulated rock. The ratio of nitrogen to phosphoric acid in a raw bone—and only such bone as has not been deprived of any considerable proportion of its nitrogenous material by some manufacturing process can properly be called "pure animal bone"—is about 1:8; in cases where the ratio of nitrogen to phosphoric acid exceeds 8, it is clear that part, at least, of the phosphoric acid has been supplied by something else than pure animal bone; but, inasmuch as nitrogen may have been introduced in some material other than bone and no longer detectible by the microscope, the presence of nitrogen and phosphoric acid in the proportions corresponding to those of bone is not proof positive that they have been supplied by bone. Finally, the differences in the iron and silica content of bone and rock respectively, afford means of distinction useful in some cases; the usefulness of this distinction is limited, however, by the facts that kitchen bone frequently contains earthy impurities rich in iron and silica, and that earthy fillers can legally be used in fertilizers and are in fact considerably used therein both as "make-weights" and as "conditioners," or materials introduced to improve the drilling qualities of the goods. The fact that the phosphoric acid in bone and rock are identical in character is probably so well known as to require no detailed consideration in this connection.

The law having required the manufacturer to guarantee the amount of certain valuable ingredients present in any brand he may put upon the market, chemical analysis is employed to verify the guaranties stamped upon the fertilizer sacks. It has, therefore, been deemed desirable in this report to enter the guaranty filed by the manufacturer in the office of the Secretary of Agriculture, in such connection with the analytical results that the two may be compared. An unfortunate practice has grown up among manufacturers of so wording the guaranty that it seems to declare the presence in the goods of an amount of valuable constituent ranging from a certain minimum to a much higher maximum; thus, "Potash, 2 to 4 per cent." is a guaranty not infrequently given. In reality, the sole guaranty is for 2 per cent. The guaranteed amounts given for each brand in the following tables, are copied from the guaranties filled by the maker of the goods with the Secretary of Agriculture, the lowest figure given for any constituent being considered to be the amount guaranteed. For compactness and because no essentially important fact is suppressed thereby, the guaranties for soluble and reverted phosphoric acid have not been given separately, but are combined into a single guaranty for available phosphoric acid; in cases where the maker's guaranty does not specifically mention available phosphoric acid, the sum of the lowest figures given by him for soluble and reverted phosphoric acid is used. The law of 1879 allowed the maker to express his guaranty for nitrogen either in terms of that element or in terms of the ammonia equivalent thereto; since ammonia is composed of three parts of hydrogen and fourteen parts of nitrogen it is a very simple matter to calculate the amount of one, when the amount of the other is given; the amount of nitrogen multiplied by 1.214 will give the corresponding amount of ammonia, and the amount of ammonia multiplied by 0.824 will give the corresponding amount of nitrogen. In these tables, the expression is in terms of nitrogen. The laws of 1901 and 1909 abolished the alternative and required that the quantity shall be given in terms of nitrogen.

Many manufacturers after complying with the terms of the law, insert additional items in their guaranties, often with the result of misleading or confusing the buyer; the latter will do well to give heed to those items only that are given as the law requires and that are presented in these tables:

A summary of the analyses made this season may be presented as follows:

Summary of Analyses Made this Season.

	Complete fertilizer.	Rock and potash.	Dissolved bone.	Dissolved rock.	Ground bone.
Number of analyses,	470	137	1	43	24
Moisture, per cent.,	9.27	9.34	7.68	9.37	6.15
Phisphoric acid:					
Total, per cent.,	9.51	10.65	12.80	15.88	21.41
Available, per cent.,	8.09	9.73	10.24	14.63	-------
Insoluble, per cent.,	1.42	.92	2.56	1.25	-------
Potash, per cent.,	5.34	4.38	-------	-------	-------
Nitrogen, per cent.,	1.56	-------	1.30	-------	3.25
Mechanical analyses of bone:					
Fine,	-------	-------	-------	-------	55.00
Coarse,	-------	-------	-------	-------	45.00
Commercial valuation,*	27.24	16.26	18.92	14.20	33.26
Average selling price,*	27.64	18.27	20.94	14.69	32.81

*Dollars per ton.

"For the purpose of indicating more specifically to the eye, cases deficient in guarantee, an asterisk has been affixed in the analytical tables where the ingredient has been found less in quantity than the manufacturer guaranteed. Too great emphasis should not be placed upon very slight deficiencies, because very slight imperfections in mixing and slight variations in analysis are practically unavoidable. The asterisk has been used, therefore, only in cases where the deficiencies amount to 0.2 per cent. or more, except where nitrogen has been guaranteed in amounts not higher than 1.0 per cent. in which case an asterisk has been affixed where the deficiency amounts to 0.1 per cent. or more."

The cases of departure of goods from their guaranteed composition observed this season, including only those cases in which it amounted to two-tenths per cent, or more, were as follows:

Summary of Instances of Deficiency from Guaranty.

	Complete fertilizer.	Rock and potash.	Dissolved bone.	Dissolved rock.	Ground bone.
Deficient in four constituents,	1	-	-	-	-
Deficient in three constituents,	11	2	-	-	-
Deficient in two constituents,	48	8	-	1	-
Deficient in one constituent,	123	36	2	4	7
Total number of samples in which deficiencies occur,	83	46	2	5	7

The cases of deficiency noted during the past eleven seasons in the composition of goods as compared with their guaranties, expressed in percentage of the total number of goods of each class analyzed, are as follows:

Percentage of Deficiency 1907-1912.

	Spring, 1907.	Fall, 1907.	Spring, 1908.	Fall, 1908.	Spring, 1909.	Fall, 1909.	Spring, 1910.	Fall, 1910.	Spring, 1911.	Fall, 1911.	Spring, 1912.
Complete fertilizers,	39.4	39.3	40.0	40.0†	39.5	46.3	28.9	35.9	45.1	46.9	39.0
Dissolved bone,	16.6	25.0	‡50.0	16.6	25.0	*	37.5	25.0	16.6	100.00	50.0
Rock and potash,	43.7	49.0	39.0	38.8	36.2	30.4	25.2	37.0	27.1	43.4	33.6
Dissolved rock,	19.5	27.0	21.2	28.5	33.3	19.5	4.3	6.3	5.9	11.9	12.5
Ground bone,	18.5	27.8	38.0	40.0	20.8	38.4	29.17	27.6	47.8	20.0	29.2
All classes except miscellaneous,	36.1	38.9	38.8	38.3	37.6	39.6	26.5	33.5	38.7	46.0	36.0

*Only two samples analyzed for which no guarantees are reported.
†Only three samples analyzed.
‡Only four samples analyzed.

A comparison of the average composition of all samples of complete fertilizers for which guaranties are recorded with the average of the corresponding guaranties, for several seasons past, including those of this season, follows:

Average Composition and Guaranty Compared.

	Average composition. Per cent.	Average guaranty. Per cent.
Spring, 1907.		
Phosphoric acid:		
Total,	9.21	8.50
Available,	8.13	7.83
Potash,	4.55	4.31
Nitrogen,	1.52	1.47
Fall, 1907.		
Phosphoric acid:		
Total,	10.39	9.42
Available,	8.34	8.07
Potash,	3.18	2.72
Nitrogen,	1.39	1.29
Spring, 1908.		
Phosphoric acid:		
Total,	10.07	8.91
Available,	8.29	7.61
Potash,	5.04	4.51
Nitrogen,	1.64	1.59
Fall, 1908.		
Phosphoric acid:		
Total,	10.29	9.31
Available,	8.29	7.96
Potash,	3.24	2.94
Nitrogen,	1.24	1.23
Spring, 1909.		
Phosphoric acid:		
Total,	9.83	8.93
Available,	8.07	7.66
Potash,	5.07	4.89
Nitrogen,	1.67	1.60
Fall, 1909.		
Phosphoric acid:		
Total,	10.13	9.34
Available,	8.27	8.08
Nitrogen,	1.33	1.26
Potash,	3.41	3.12
Spring, 1910.		
Phosphoric acid:		
Total,	9.80	8.80
Available,	8.26	7.62
Potash,	5.20	4.68
Nitrogen,	1.63	1.60
Fall, 1910.		
Phosphoric acid:		
Total,	9.72	8.80
Available,	8.26	7.62
Potash,	5.20	4.68
Nitrogen,	1.63	1.60
Spring, 1911.		
Phosphoric acid:		
Total,	9.86	8.96
Available,	8.31	7.86
Potash,	4.97	4.65
Nitrogen,	1.53	1.54
Fall, 1911.		
Phosphoric acid:		
Total,	9.59	9.09
Available,	8.20	7.87
Potash,	3.63	3.39
Nitrogen,	1.12	1.19

Average Composition and Guaranty Compared—Continued.

	Average composition. Per cent.	Average guaranty. Per cent.
Spring, 1912.		
Phosphoric acid:		
Total,	9.51	8.82
Available,	8.09	7.78
Potash,	5.34	5.05
Nitrogen,	1.56	1.58

It is of interest to note how closely the series of valuations based upon the wholesale price of raw materials in the principal markets during the most important buying season and upon certain average allowances for expenses and profits on the part of the mixer and jobber, coincides with the retail prices later ascertained. A comparison for several seasons past is given below:

Comparison of Selling Price and Valuation, 1907-1912.

	Selling price.	Valuation.	Excess of valuation over selling price.
Complete fertilizers:			
1907, Spring,	24.60	26.84	2.24
Fall,	22.71	24.59	1.88
1908, Spring,	25.69	26.23	.54
Fall,	22.34	23.88	1.54
1909, Spring,	24.88	25.31	.43
Fall,	22.07	22.25	.14
1910, Spring,	25.26	26.63	1.43
Fall,	21.76	22.24	.48
1911, Spring,	24.97	25.95	.98
Fall,	21.73	22.33	.61
1912, Spring,	27.64	27.24	—.40
Dissolved Bone:			
1907, Spring,	22.28	25.08	2.80
Fall,	22.09	27.01	4.92
1908, Spring,	21.11	23.09	1.98
Fall,	22.48	26.05	3.57
1909, Spring,	22.25	21.57	—.68
Fall,	24.50	22.85	—1.65
1910, Spring,	22.17	21.47	—.70
Fall,	25.80	25.70	—.10
1911, Spring,	20.33	23.82	3.49
Fall,	24.88	21.51	—3.37
1912, Spring,	20.94	18.92	2.82

Comparison of Selling Price and Valuation, 1906-1911—Continued

	Selling price.	Valuation.	Excess of valuation over selling price.
Rock and potash:			
1907, Spring,	16.94	16.53	—.41
Fall,	16.58	15.82	—.76
1908, Spring,	16.86	16.24	—.62
Fall,	16.43	16.17	—.26
1909, Spring,	16.98	15.94	1.04
Fall,	16.10	15.50	—.60
1910, Spring,	17.16	16.08	—1.08
Fall,	16.38	16.34	—.04
1911, Spring,	17.05	15.99	—1.06
Fall,	16.25	16.07	—.18
1912, Spring,	18.17	16.26	—1.91
Dissolved rock:			
1907, Spring,	14.04	14.72	.68
Fall,	14.16	14.67	.51
1908, Spring,	14.72	14.92	.20
Fall,	14.31	14.86	.55
1909, Spring,	14.76	13.62	—1.14
Fall,	13.86	14.02	.16
1910, Spring,	14.56	14.00	—.56
Fall,	14.01	14.15	.14
1911, Spring,	15.83	14.26	—1.53
Fall,	14.00	13.78	.22
1912, Spring,	14.69	14.20	—.49
Ground bone:			
1907, Spring,	31.55	29.64	—1.91
Fall,	28.92	28.80	—.12
1908, Spring,	29.04	28.96	—.08
Fall,	28.18	17.90	—1.23
1909, Spring,	30.70	30.28	—.42
Fall,	29.39	28.71	—.68
1910, Spring,	30.19	30.27	.08
Fall,	29.98	31.10	1.12
1911, Spring,	30.93	31.47	.54
Fall,	31.17	31.18	.01
1912, Spring,	32.81	33.26	.45

MATERIALS USED IN FERTILIZERS.

The microscopic examination of the nitrogenous fertilizers for leather, hair, and other materials the use of which without notice is prohibited by the Act of May 1, 1909, revealed in no case such quantity of any of these substances as might not fairly be regarded as an accidental trace. No instance has been reported by the sampling agents in which a declaration of the presence of such material has been made. It is, however, a matter of quite general knowledge that substances of this kind are being largely used in fertilizer mixtures; but, in most cases at least, only after such treatment as results in the destruction of the characteristic tissues and, at the same time, wholly or partly in that of the organic compounds originally present.

In conformity with the requirements of the Act of April 23, 1909, many firms dropped from the brand names of goods manufactured by them the word "bone" hitherto forming part of said names. Where such change in name appears, it may be taken as evidence that the prosphoric acid is derived, at least in part, from something else than bone.

ORGANIZATION OF THE WORK.

In conclusion, I would state that the work of the season has been performed under my direction, as follows:

The nitrogen determinations by W. Thomas, B. S.; those of total phosphoric acid by H. D. Edmiston; of insoluble phosphoric acid by L. G. Willis, B. S., and P. W. Clemmer, B. S.; of potash by E. S. Erb, M. S.; computations by Miss Ellen Bachman, and chlorin, by Charles Kern; and the preparation of samples, care of records, and the detail of the compilation of this bulletin , by G. C. Given, M. S. To these trained and experienced assistants, my acknowledgments are due for loyal and efficient service.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	THE AMERICAN AGRICULTURAL CHEM. CO., NEW YORK.		
1174	Ammoniated Phosphate and Potash,	Theodore Gerhard, Gilbert,	11.49
281	†Complete Manure with 10% Potash,	D. M. Parkhill, Connellsville,	8.39
66		W. V. Shirk, Oakland Mils,	
1119		Abbot Bros., Sugar Grove,	
787	†High Grade Compound,	Paxton Flour and Feed Co., Bowmansdale.	10.53
556		B. F. Shannon & Co., Butler,	
1113		E. D. Everett Co., Warren,	
1135	†Peerless Vegetable and Grain Grower,	Wysox Produce Co., Wysox,	10.89
786		Paxton Flour and Feed Co., Bowmansdale.	
1390		Billings & Kelder, New Albany,	
189	†Special Potash Mixture,	J. A. Romberger, Elizabethville,	11.08
11		John H. Reed, Cressona, R. D.,	
270		J. A. McCombs, New Salem,	
1026	†Superior Compound,	Dan'l W. Eiler, Schuylkill Haven,	11.15
1829		W. P. Rouse & Son, North East,	
65	†10 Per cent. Potash Mixture for Potatoes	W. V. Shirk, Oakland Mills,	8.69
44		John Artley, Muncy,	
183		J. A. Romberger, Elizabethtown,	
1184	†Top Dresser for Grass,	Philip Walters, Millford,	10.84
9		Harry Keefer, Pine Grove, R. D.,	
1667		Greencastle Elevator Co. Greencastle,	
596	†Bradley's Bean and Potato Phosphate,	G. H. Smith, Franklin Forks,	11.89
76		George Iff & Sons, Evans City,	
1196		Levi Berkey, Somerset,	
486	†Bradley's B. D. Sea Fowl Guano,	Eli Yost, McEwensville,	10.65
77		George Iff & Sons, Evans City,	
573		A. Krause & Son, Marwod,	
1862	Bradley's Complete Manure for Potatoes and Vegetables.	J. H. Jones, Hydetown,	7.94
597	†Bradley's Dissolved Phosphate & Potash,	G. H. Smith, Franklin Forks,	12.39
80		Geo. Iff & Sons, Evans City,	
1441		Geo. R. Andrews, Enon Valley,	
78	†Bradley's Niagara Phosphate,	Geo. Iff & Sons, Evans City,	10.59
1510		Schultz & Pardoe, Franklin,	
275	†Canton Chemical, Baker's Special Wheat, Corn and Grass Mixture.	Kings Bros., Uniontown,	12.06
100		F. W. Sonner Hwd. Co., Tremont,	
802		John B. Buckman, Newtown,	
99	Canton Chemical, Baker's Standard High Grade Guano.	F. W. Sonner Hdw. Co., Tremont,	10.67
1078	Canton Chemical, C. C. C. Special Compound.	W. B. Winey, Middleburg,	11.77
1077	†Canton Chemical, Eagle Phosphate,	W. B. Winey, Middleburg,	8.92
1027		Thomas Kramer, Schuylkill Haven,	
1757		F. S. Lewis, Quakertown,	
1945	Canton Chemical, Harrow Brand Crop Guano.	Wm. Gates, Kittanning,	7.30
498	†Canton Chemical, Potato Manure,	F. L. Kahres, Rebuck,	11.02
276		King Bros., Uniontown,	
544		W. J. Schmick & Son, Germansville,	
545	†Canton Chemical, Resurgant Guano,	W. J. Schmick & Son, Germansville,	11.45
184		J. A. Pomberger, Elizabethville,	
803		John B. Buckman, Newtown,	
1356	†Crocker's Ammoniated Superphosphate,	Wm. Grube, Hecla,	10.77
1847		B. D. Moses, Springboro,	
1114	†Crocker's Complete Manure,	E. D. Everett Co., Warren,	11.24
94		W. H. Kaufman, Harmony,	
1581		Farmer's Hdw Co., Shippenville,	

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†Composite sample.

FERTILIZERS.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
8.69	8.00	.87	9.56	9.00	3.38	....	3.38	2.00	.56	.41	17.05	18.00	1174
7.12	6.00	1.91	9.03	7.00	9.27	....	*9.27	10.00	*3.03	3.29	35.95	38.00 31.50 35.00	280 66 1119
8.76	8.00	1.44	10.20	9.00	9.94	....	9.94	10.00	1.62	1.65	31.47	28.00 30.00 33.00	787 556 1113
*7.62	8.00	1.86	9.48	9.00	5.25	....	5.25	5.00	1.57	1.65	25.51	25.00 25.00 27.00	1135 783 1390
9.51	9.00	1.45	10.96	10.00	2.00	4.37	*6.37	7.00	.89	.82	26.42	23.00 23.00 32.00	189 11 270
8.79	8.00	1.29	10.08	9.00	4.52	....	4.52	4.00	1.74	1.65	26.62	24.00 24.50	1025 1829
5.51	5.00	1.31	6.82	6.00	10.50	....	10.50	10.00	1.46	1.65	27.97	25.00 27.50 27.00	65 44 183
8.77	8.00	.64	9.41	9.00	4.95	....	4.95	5.00	*4.60	4.94	39.67	35.00 40.00 36.00	1184 9 1667
8.33	8.00	1.33	9.56	9.00	3.96	....	3.96	4.00	1.04	.82	22.26	25.00 24.00 20.00	596 76 1196
8.16	8.00	1.59	9.75	9.00	2.16	....	2.16	1.50	2.12	2.06	25.26	22.00 25.00 25.00	486 77 573
*7.57	8.00	1.70	9.27	9.00	7.86	....	7.86	7.00	3.27	3.29	35.97	36.00	1862
8.28	8.00	.84	9.12	9.00	2.28	....	2.28	2.00	1.10	1.03	20.59	23.00 23.00 21.85	597 80 1441
8.13	7.00	.47	8.60	8.00	1.88	....	1.88	1.00	1.05	.82	19.66	21.00 30.00	78 1510
8.99	9.00	1.54	10.53	10.00	2.62	....	2.62	2.00	1.17	.82	22.22	22.50 25.00 28.00	275 100 802
8.85	8.00	.77	9.62	9.00	3,38	....	3.38	3.00	2.07	2.06	26.60	30.00	99
9.19	8.00	1.11	10.30	9.00	5.75	....	*5.75	6.00	*1.86	2.06	28.62	30.00	1078
7.35	7.00	1.28	8.63	8.00	1.39	....	1.39	1.00	.91	.82	18.06	18.00 19.00 20.00	1077 1027 1757
9.20	8.00	1.38	10.58	9.00	1.40	....	1.40	1.00	.84	.82	19.76	20.00	1945
8.19	6.00	1.63	9.82	7.00	5.16	....	5.16	5.00	1.15	1.23	24.03	24.00 30.00 22.00	498 276 544
8.14	8.00	1.29	9.43	9.00	4.16	....	4.16	4.00	.86	.82	21.48	20.00 20.00 30.00	545 184 803
9.33	9.00	1.28	10.61	10.00	2.33	....	2.33	2.00	2.37	2.47	27.66	...... 28.00	1356 1847
8.11	8.00	1.64	9.75	9.00	3.99	....	3.99	4.00	.96	.82	21.87	24.00 20.00 25.00	1114 94 1581

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
134	†Crocker's General Crop Fertilizer,	Hall, Kaul & Hyde, St. Marys,	10.72
93		W. H. Kaufman, Harmony,	
1509		H. B. Mitchell & Co., Emlenton.	
135	†Crocker's New Rival Fertilizer,	Hall, Kaul & Hyde, St. Marys,	10.60
1104		Davis Bros., Kane,	
132	†Croker's Potato, Hop and Tobacco Fertilizer.	C. O. Salberg, Ridgway,	10.24
95		W. H. Kaufman, Harmony,	
282		D. M. Parkhill, Connellsville,	
1112	†Crocker's Universal Grain Grower,	E. D. Everett & Co., Warren,	10.21
1582		Farmers' Hdw. Co., Shippensville,	
1106	†Crocker's Wheat and Corn Fertilizer,	Davis Bros., Kane,	9.44
854		Edgar Watters, Jamestown,	
1111		E. D. Everett Co., Warren,	
1560	†Detrick's Corn and Oats Fertilizer,	C. M. Honeywell, Dallas,	11.39
559		B. F. Shannon, Butler,	
1795		. F. Horting, Newport,	
558	†Detrick's Imperial Compound,	B. F. Shannon & Co., Butler,	11.70
1195		Levi Berkey, Somerset,	
119	Detrick's Paragon Ammoniated Phosphate and Potash.	J. S. Jobst, Emaus,	9.80
118	Detrick's Quick Step Phosphate for Potatoes and Tobacco.	J. S. Jobst, Emaus,	10.26
705	†Great Eastern General,	F. W. Dutcher, Susquehanna,	10.37
1500		Wm. J. Johnston, Sinking Springs,	
1415	†Great Eastern High Grade Cabbage Grower.	Dennis Dillon, Patton, R. D. 2,	9.63
1391		Ira Hottenstein, Overton,	
1876		S. A. Detrich, Milford,	
1498	Great Eastern Northern Corn Special,	Wm. J. Johnston, Sinking Springs,	13.06
1499	Great Eastern Vegetable Vine and Tobacco Fertilizer.	Wm. J. Johnston, Sinking Springs,	10.29
1303	Lazaretto Ammoniated Phosphate,	Grove & Uffleman, Parke,	11.87
	†Lazaretto Special Potato Fertilizer,	Grove & Uffleman, Parke,	8.02
1302		Walker & Walker, Rockwood R. F. D. 2.	
1733			
494	Maryland Ammoniated Phosphate,	J. A. Gass, Sunbury,	12.23
784	Maryland O. K. Ammoniated Fertilizer,	Paxton Flour & Feed Co., Bowmansdale.	10.21
1773	†Maryland Special Compound for Potatoes and Tobacco.	T. E. Paxon, Hatboro,	10.65
116		Henry F. Rupp, Breinigsville,	
1830		W. P. Ponse & Son, North East,	
637	†Michigan Carbon Works, General Crop Fertilizer.	J. E. Knerr, Kridersville, R. D. 3,	10.58
1854		Davis & Hyde, Spartansburg,	
1927	Michigan Carbon Works, Red Line Complete Fertilizer.	W. E. Nixon, Mill Hall, R. D. 1,	10.31
858	Milsom's Buffalo Fertilizer,	John T. Crill, Mercer,	10.13
79	†Milsom's Buffalo Guano,	Geo. Iff & Sons, Evans City,	11.72
47		John Artley, Muncy,	
846		A. C. Lininger, Greenville,	
1348	Milsom's Corn Fertilizer,	D. R. Stein, Orwigsburg, R. D.,	11.94
661	†Milsom's Wheat, Oats and Barley Fertilizer.	Dufton Hdw. Co., Clearfield,	10.42
867		Edgar C. Gordon, Waynesburg,	
633	Moro-Philips Farmers' Potato Mixture,	Peter Houghenbrach, Nazareth,	8.37
904	†Moro-Philips 10% Potato and Vegetable Manure.	Simon Carl, Numidia,	9.13
1782		S. K. Dunkle, Myerstown, R. No. 5,	
1735	Northwestern Challenge Crop Grower,	Jefferson Altfather, Berlin,	9.63
1465	†Northwestern 10% Potato Fertilizer,	N. R. Yost, Myerstown,	9.88
643		John Kunkel, Bath,	
1517		Clyde D. Duffee, Oil City,	
849	†Northwestern Truck Phosphate,	Greenville Coal & Ice Co., Greenville,	7.71
1516		Clyde D. Duffee, Oil City,	

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†Composite sample.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
8.05	7.00	1.89	9.94	8.00	2.73	-------	2.73	1.00	.96	.82	20.66	24.00 20.00 21.00	134 93 1509
9.89	9.00	1.35	11.24	10.00	3.34	-------	3.34	2.00	1.37	1.23	24.73	------ 27.00	135 1104
8.66	8.00	2.11	10.77	9.00	3.02	-------	3.02	3.00	*1.85	2.06	25.72	28.00 26.00 27.00	132 95 282
9.50	8.00	1.86	11.36	9.00	1.86	-------	1.86	2.00	.86	.82	20.74	23.00 23.00	1112 1582
8.48	8.00	1.60	10.08	9.00	2.14	-------	2.14	1.50	2.19	2.06	26.01	28.00 23.00 28.00	1106 854 1111
9.69	9.00	1.10	10.79	10.00	3.36	-------	3.36	3.00	.86	.82	22.12	20.00 23.00 18.25	1503 559 1795
8.35	8.00	.93	9.28	9.00	2.12	-------	2.12	2.00	.86	.82	19.40	21.00 18.00	558 1195
7.54	7.00	1.26	8.80	8.00	1.48	-------	1.48	1.00	.85	.82	18.12	20.00	119
8.70	8.00	.92	9.62	9.00	4.58	-------	4.58	4.00	2.31	2.47	28.89	30.00	118
8.20	8.00	1.21	9.41	9.00	4.41	-------	4.41	4.00	.99	.82	22.39	22.00 21.00	705 15
9.70	9.00	.84	10.54	10.00	7.36	-------	7.36	7.00	.91	.82	26.31	25.00 25.00 20.00	1415 1391 1873
9.30	9.00	.99	10.29	10.00	2.19	-------	2.19	2.00	*2.06	2.47	25.96	26.00	1498
8.87	8.00	.88	9.75	9.00	3.36	-------	3.36	3.00	2.34	2.06	27.99	24.00	1499
8.12	8.00	1.44	9.56	9.00	2.18	-------	2.18	2.00	.94	.82	19.94	17.00	1303
8.59	8.00	1.12	9.71	9.00	3.97	-------	3.97	4.00	.74	.82	21.15	18.50 21.00	1302 1733
8.26	8.00	1.28	9.54	9.00	3.04	-------	3.04	3.00	*1.26	1.65	22.24	25.00	494
9.00	8.00	.46	9.46	9.00	2.37	-------	2.37	2.00	1.14	.82	21.49	18.00	784
8.71	8.00	1.16	9.87	9.00	9.39	-------	*9.39	10.00	*1.36	1.65	29.58	32.00 27.00 29.00	1773 116 1830
8.53	8.00	1.62	10.15	9.00	4.31	-------	4.31	4.00	.80	.82	21.93	------ 22.50	637 1854
7.16	7.00	1.29	8.45	8.00	1.82	-------	1.82	1.00	.81	.82	17.82	20.00	1927
7.88	8.00	1.30	9.18	9.00	1.80	-------	1.80	1.50	2.05	2.06	24.16	24.00	858
8.46	8.00	1.16	9.62	9.00	4.31	-------	4.31	4.00	.84	.82	21.84	24.00 21.00 22.00	79 47 846
9.17	9.00	.89	10.06	10.00	2.85	-------	2.85	2.00	*1.60	2.47	24.37	26.00	1348
8.43	8.00	2.36	10.79	9.00	2.68	-------	2.68	2.00	1.14	.82	22.15	24.00 25.00	661 867
6.08	6.00	1.84	7.92	7.00	4.91	-------	4.91	5.00	1.56	1.23	23.30	-------	633
8.61	8.00	.73	9.34	9.00	9.57	-------	*9.57	10.00	1.62	1.65	31.59	27.00 23.00	904 1782
8.19	8.00	1.03	9.22	9.00	2.29	-------	2.29	2.00	1.04	1.03	24.41	20.00	1735
8.60	8.00	1.05	9.65	9.00	10.66	-------	10.66	10.00	1.61	1.65	31.83	27.50 28.00 29.00	1465 643 1517
6.29	6.00	2.27	8.56	7.00	4.69	-------	*4.69	5.00	1.24	1.23	22.41	24.00 22.00	849 1560

***Constituent falls below guaranty.**

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
1194	†Packer's Union Animal Corn Fertilizer,	S. A. Detrich, Milford,	6.87
1561		H. W. Herdman, Kunkle,	
707	Packer's Union Gardener's Complete Manure.	Mrs. F. A. Whitney, for own use, Susquehanna.	8.59
1562	†Packer's Union Potato Manure,	H. W. Herdman, Kunkle,	12.09
17		Monroe Savidge, Hegins, R. D.,	
1877		S. A. Detrich, Milford,	
485	†Packer's Union Universal Fertilizer,	Eli Yost, McEwensville,	11.08
18		Monroe Savidge, Hegins, R. D.,	
706		Mrs. F. A. Whitney, Susquehanna,	
1883	Quinnipiac B. Fertilizer,	Milton Smith, Milport,	11.16
541	†Quinnipiac Mohawk Fertilizer,	Aaron Schleicher, Slatington, R. D. 2,	9.14
1881		Stewart Bittenbender, Stroudsburg,	
1583	Potato Phosphate,	Farmers' Hwd. Co., Shippensville,	8.79
1607	Read's Leader B. & B. Fertilizer,	O. S. Shambacher, East Point,	8.99
1389	Read's Farmers' Friend Superphosphate,	Billings & Kelder, New Albany,	13.27
938	†Reeses Pilgrim Fertilizer,	Franklin Beck, New Providence,	11.42
1633		J. F. Goodling, Loganville,	
1352	Sharpless & Carpenter Dissolved Fertilizer for Potatoes and General Use.	Jonas Kunkle, New Ringgold, R. D.,	10.18
595	†Sharpless & Carpenter Gilt Edge Potato and Tobacco Manure.	J. C. Harrington, Montrose,	11.87
45		John Artley, Muncy,	
1006		F. F. Houseknecht, Conyngham,	
450	Sharpless & Carpenter No. 2 for Grain and Grass.	L. C. Thompson, Pottsville,	14.12
579	†Sharpless & Carpenter Potato, Corn and Truck Guano.	J. A. Williams, Friendsville,	10.16
451		L. C. Thompson, Pottsville,	
594		J. C. Harrington, Montrose,	
310	†Susquehanna Ammoniated Phosphate,	Caleb Allen, Kelton,	12.73
1232		Henry Sunday, East Berlin,	
312	Susquehanna Animal Phosphate,	Caleb Allen, Kelton,	10.17
247	†Susquehanna Crop Grower,	Z. J. Peters, Gernsey,	9.52
1705		J. Waren Imler, Imler,	
200	†Susquehanna Potato Phosphate,	P. A. Enders, Halifax, R. No. 1,	11.29
311		Caleb Allen, Kelton,	
1047	†Susquehanna Special Potato and Tobacco Manure.	J. C. Meirley, Alexandria,	9.69
248		J. J. Peters, Gurnsey,	
1475		E. S. Erb, Palmyra, R. D. No. 2,	
1752	Allen's Special Brand Potato Manure,	Harvey Detwiler, Chester Springs,	9.27
269	Allen's Special for Wheat and Grass,	J. A. McCombs, New Salem,	6.65
1386	Tygert Allen's Standard Brand Phosphate,	Harvey Detwiler, Chester Springs,	8.41
1750	Tygert Allen's Star Brand Phosphate,	Harvey Detwiler, Chester Springs,	9.18
1751	Tygert Allen's Star Potato Grower,	Harvey Detwiler, Chester Springs,	9.28
91	†Wheeler's Corn Fertilizer,	G. A. Zeigler, Harmony,	11.07
1132		H. N. Shiffler, LeRaysville,	
160	Wheeler's Potato Manure,	C. A. Brader, Bethlehem, R. F. D.,	12.22
159	Wheeler's Special Vegetable Manure,	C. A. Brader, Bethlehem, R. F. D.,	9.89
1167	†Wheeler's Royal Wheat Grower,	Elias Shuman, Catawissa, R. D.,	9.55
1613		Sawyer Bros., Liberty,	
[illegible]	†Williams & Clark Good Grower Potato Phosphate.	A. Steen & Co., Elwyn,	9.62
143		Gallup Hdw. Co., Port Allegany,	
728		J. S. Moore, Oakdale,	
144	Williams & Clark Prolific Fertilizer,	Gallup Hdw. Co., Port Allegany,	6.81
726	†Williams & Clark Royal Phosphate,	J. S. Moore, Oakdale,	10.32
1181		Philip Walters, Milford,	
839	†Williams & Clark American Universal Fertilizer.	C. F. Thompson, Beaver Falls,	11.16
114		Henry F. Rupp, Breinigsville,	
1754		Jacob Rush, Plumsteadville,	
1084	†Zell's Economizer Phosphate,	Kinslowe & Ewing, Newton Hamilton	11.46
12		John H. Reed, Cressona, R. D.,	
1797		B. F. Horting, Newport,	

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
9.20	9.00	1.61	10.81	10.00	2.25	-------	2.25	2.00	2.63	2.47	29.24	30.00 26.00	1149 1561
6.92	6.00	.60	7.52	7.00	9.82	-------	9.82	10.00	3.28	3.29	36.78	35.00	700
8.88	8.00	1.03	9.91	9.00	5.95	-------	5.95	6.00	*1.75	2.06	27.98	28.75 30.00 32.00	1562 17 1877
8.19	8.00	1.12	9.31	9.00	4.40	-------	4.40	4.00	.98	.82	22.34	19.00 22.00 23.00	485 18 706
8.27	8.00	1.25	9.52	9.00	4.04	-------	4.04	4.00	1.02	.82	22.10	-------	1883
7.69	7.00	1.30	8.99	8.00	1.70	-------	1.70	1.00	.91	.82	18.73	17.00 ------	541 1881
7.98	8.00	1.63	9.61	9.00	3.33	-------	3.33	3.00	*1.21	2.06	22.20	24.00	1583
7.15	7.00	1.75	8.90	8.00	1.22	-------	1.22	1.00	.76	.82	17.18	19.00	1607
8.11	8.00	1.40	9.51	9.00	2.78	-------	*2.78	3.00	2.14	2.06	26.00	26.00	1389
8.50	8.00	1.02	9.52	9.00	4.48	-------	4.48	4.00	.98	.82	22.71	19.50 20.00	938 1633
8.75	8.00	.85	9.56	9.00	5.99	-------	5.99	6.00	*1.72	2.06	27.56	27.00	1352
8.31	8.00	1.44	9.75	9.00	10.22	-------	10.22	10.00	1.49	1.65	30.81 28.50	32.00 30.00 28.50	595 45 1006
7.26	7.00	1.38	8.64	8.00	1.31	-------	1.31	1.00	.97	.82	23.84	22.00	450
7.14	6.00	1.80	8.94	7.00	5.41	-------	5.41	5.00	1.20	1.23	23.54	25.00 25.00 26.00	579 451 594
8.36	8.00	1.20	9.56	9.00	2.16	-------	2.16	2.00	1.73	1.65	23.67	21.00 22.00	310 1232
9.11	9.00	3.86	12.97	10.00	2.14	-------	2.14	2.00	1.73	1.65	25.62	25.00	312
7.58	7.00	1.08	8.66	8.00	1.91	-------	1.91	1.00	.85	.82	18.48	18.00 18.00	247 1705
9.22	8.00	.36	9.62	9.00	6.48	-------	6.48	5.00	1.74	1.65	28.62	------ 25.00	200 311
8.60	8.00	1.24	9.84	9.00	9.97	-------	9.97	10.00	*1.44	1.65	30.54	32.00 28.00 ------	1047 248 1475
9.26	8.00	.94	10.20	9.00	6.04	-------	6.04	6.00	2.37	2.06	31.40	29.00	1752
*6.63	7.00	2.06	8.69	8.00	1.50	-------	1.50	1.00	1.23	.82	19.40	20.00	269
8.35	8.00	1.44	9.79	9.00	2.37	-------	2.37	2.00	1.60	1.65	23.12	24.00	1386
8.82	8.00	.96	9.78	9.00	3.38	-------	3.38	3.00	2.42	2.06	28.81	26.00	1750
7.19	6.00	1.25	8.44	7.00	5.72	-------	5.72	5.00	1.66	1.23	25.69	24.00	1751
*7.79	8.00	2.22	10.01	9.00	2.47	-------	2.47	2.00	1.58	1.65	23.20	26.00 19.50	91 1132
8.16	8.00	1.31	9.47	9.00	3.34	-------	3.34	3.00	*1.75	2.06	24.58	18.50	160
8.05	8.00	1.53	9.58	9.00	10.36	-------	10.36	10.00	1.67	1.65	31.44	28.00	159
9.09	8.00	1.05	10.14	9.00	2.26	-------	2.26	2.00	.83	.82	20.36	20.00 19.20	1167 1613
6.36	6.00	1.67	8.03	7.00	5.33	-------	5.33	5.00	1.07	1.23	21.94	23.00 26.00 28.00	325 143 728
7.19	7.00	2.05	9.24	8.00	1.41	-------	1.41	1.00	.86	.82	18.03	21.00	144
*7.72	8.00	2.21	9.93	9.00	2.46	-------	2.46	2.00	1.11	1.03	20.88	24.00 19.00	726 1181
*7.15	8.00	1.54	*8.69	9.00	2.51	-------	2.51	2.00	*1.45	1.65	21.61	23.75 21.00 22.00	839 114 1754
8.23	8.00	1.23	9.46	9.00	2.20	-------	2.20	2.00	.98	.82	19.94	19.75 19.00 17.00	1084 12 1797

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
261	†Zell's Little Giant,	O. F. Arnold, Dillsburg, R. D.,	10.85
13		John H. Reed, Cressona, R. D.,	
504		W. S. Engle, Dalmatia,	
260	†Zell's Special Compound for Potatoes and Vegetables.	O. F. Arnold, Dillsburg, R. D.,	9.75
539		Chas. H. Kistler, Slatington, R.D.2,	
	AMERICAN FERTILIZER CO., BALTIMORE, MD.		
793	†American Champion Grain Grower,	George Watson, Embreeville,	12.86
955		Lancaster Co. Farmers' Association, Quarryvile.	
791	†American Special Compound Guano,	George Watson, Embreeville,	9.82
408		Jonas Eavenson, Christiana,	
1632		H. W. Rehmeyer, Turnpike,	
	AMERICAN REDUCTION CO., PITTSBURG, PA.		
574	†Common Sense,	A. Steinhiser, Marwood,	4.12
267		Weddle & Sutton, West Newton,	
1935		R. W. Rogers, Freeport, R. D.,	
	ARMOUR FERTILIZER WORKS, BALTIMORE, MD.		
871	Armour's Trucker,	Loucks Hardware Co., Scottdale,	9.51
1823	Bone, Blood and Potash,	J. F. Chisholm, McKean,	5.58
448	†Crop Grower,	Seligman & Co., Tamaqua,	9.92
413		Miller & Amon, McDonald,	
603		S. U. Troutman, Bedford, R. D. 2,	
756	†Five Per Cent. Trucker,	Nickles & Stewart, Shippensburg,	8.37
351		H. S. Newcomer, Mt. Joy,	
1200		H. C. Beerits & Sons, Somerset,	
171	†Fruit and Root Crop Special,	M. S. Bachman, Lebanon,	8.41
340		Sol. Brinser, Middletown, R. D.,	
130	†Grain Grower,	C. O. Salberg, Ridgway,	10.76
126		Hibner Hoover Co., DuBois,	
170		M. L. Bachman, Lebanon,	
125	†High Grade Potato,	Hibner Hoover Co., DuBois,	9.54
39		S. G. Updegraff, Williamsport,	
352		H. S. Newcomer, Mt. Joy,	
38	†Royal Ammoniated,	S. G. Updegraff, Williamsport,	10.12
15		Heffner & Luckenbill, Friedensburg,	
411		Miller & Amon, McDonald,	
257	Special Mixture,	Grover C. Myers, Idaville,	7.24
524	†Superior,	A. Skelly, Ebensburg,	10.18
131		C. O. Salberg, Ridgway,	
667		Wm. Wood, Osceola Mills,	
169	†Wheat, Corn and Oats Special,	M. L. Bachman, Lebanon,	6.99
14		Heffner & Luckenbill, Friedensburg,	
353		H. S. Newcomer, Mt. Joy,	
341	†Wheat and Grass Special,	Sol. Brinser, Middletown,	9.33
1734		S. W. Fritz, Garrett,	
	ATLANTIC FERTILIZER CO., BALTIMORE, MD.		
195	Arrow Brand Special,	J. C. Lebo, Millersburg, R. No. 1,	9.87
1290		Geo. H. Holtzinger, Red Lion,	
1300	Gold Medal Superior for All Crops,	Grove & Uffelman, Parke,	6.84
1289	Good Luck Special Potash Manure (1-8-7),	Geo. W. Holtzinger, Red Lion,	7.18
1291	Royal Potato and Tomato Manure,	Geo. W. Holtzinger, Red Lion,	7.12
1301	†XX Special Compound for Potatoes,	Grove & Uffelman, Parke,	9.06
196		J. C. Lebo, Millersburg, R. No. 1,	
1930		S. J. Sider, Blacklick,	

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
7.37	7.00	1.15	8.52	8.00	1.38	-------	1.38	1.00	.98	.82	18.44	17.00 17.50 17.00	261 13 504
9.00	8.00	1.11	10.11	9.00	3.88	-------	3.88	4.00	*2.11	2.47	27.67	27.00 27.50	260 539
7.93	8.00	2.08	10.01	9.00	4.14	-------	4.14	4.00	1.00	.82	22.27	22.00 17.00	793 955
7.34	7.00	1.61	8.95	8.00	2.99	-------	2.99	3.00	.78	.41	19.38	20.00 17.00 15.00	791 408 1632
7.80	7.00	.89	8.69	8.00	1.70	-------	1.70	1.00	1.45	1.23	21.14	20.00 17.00 ------	574 267 1935
8.95	8.00	.95	9.90	8.50	6.53	.35	6.88	7.00	*3.86	4.11	38.67	42.00	871
10.33	8.00	6.76	17.09	8.50	1.33	6.18	7.51	7.00	*3.87	4.11	44.89	38.00	1823
7.95	8.00	1.39	9.34	8.50	2.54	-------	2.54	2.00	.96	.82	20.12	23.00 23.00 18.00	448 413 603
8.47	8.00	.96	9.43	8.50	6.92	-------	6.92	7.00	*3.68	4.11	37.22	36.00 37.00 35.00	756 351 1200
*5.94	8.00	2.93	8.87	8.50	5.16	-------	5.16	5.00	1.61	1.65	24.42	24.00 22.50	171 340
8.31	8.00	1.19	9.50	8.50	2.36	-------	2.36	2.00	1.46	1.65	22.46	21.00 25.00 21.00	130 126 170
7.98	8.00	1.25	9.23	8.50	10.01	-------	10.01	10.00	*1.36	1.65	29.52	35.00 32.00 29.00	125 39 352
8.28	8.00	.64	8.92	8.50	4.21	-------	4.21	4.00	.99	.82	21.97	24.00 21.00 25.00	38 15 411
8.04	8.00	.28	8.32	8.50	1.02	-------	1.02	1.00	.55	.41	15.85	15.00	257
8.35	8.00	.96	9.31	8.50	6.90	-------	6.90	7.00	.89	.82	24.52	25.00 26.00 30.00	524 131 667
7.34	7.00	.50	7.84	7.50	1.30	-------	1.30	1.00	.97	.82	17.80	18.00 19.00 16.00	169 14 353
7.17	7.00	.64	7.81	7.50	5.31	-------	5.31	5.00	.96	.82	21.75	18.25 22.00	341 1734
*7.62	8.00	.73	*8.35	9.00	4.34	-------	4.34	4.00	.94	.82	21.28	18.50 18.50	195 1290
8.68	8.00	.77	9.45	9.00	3.36	-------	3.36	3.30	1.65	1.65	24.58	20.50	1300
8.82	8.00	.74	9.56	9.00	6.48	-------	*6.48	7.00	1.01	.82	24.93	21.00	1289
7.15	7.00	.82	7.97	8.00	6.21	-------	6.21	5.00	1.63	1.65	25.93	22.00	1291
*6.05	8.00	3.17	9.22	9.00	9.19	-------	*9.19	10.00	*1.41	1.65	27.20	25.50 27.00 30.00	1301 196 1930

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	R. S. AUCKER, SHAMOKIN, PA.		
1070	Grade "B" Bone and Slaughterhouse Phosphate.	Geo. R. Hendrick & Son, Selinsgrove.	8.43
1069	Grade "D" Bone and Slaughterhouse Phosphate.	Geo. R. Hendrick & Son, Selinsgrove.	8.36
1071	High Grade Potash Ammoniated Potato and Truck Phosphate.	Geo. R. Hendrick & Son, Selinsgrove.	10.38
	W. C. BALL, MEDIA, PA.		
330	Ball's Potato Manure,	W. C. Ball, Media,	10.38
328	Ball's $25 Goods,	W. C. Ball, Media,	10.54
2033	Special Mixture 4-8-10,	W. C. Ball, Media,	------
	BALTIMORE FERTILIZER CO., BALTIMORE, MD.		
613	Honest Potato Grower,	Howard Wells, McConnellsburg,	6.76
	BALTIMORE PULVERIZING CO., BALTIMORE, MD.		
1220	Excelsior Compound,	J. D. Gochenour, Dillsburg,	8.06
1221	Practical Fertilizer,	J. D. Gochenour, Dillsburg,	7.91
	J. H. BARTENSCHLAGER, STEWARTSTOWN, PA.		
1312	Bartenschlager's Potato, Tobacco and Vegetable Compound.	J. H. Bartenschlager, Stewartstown,	9.92
	BAUGH & SONS CO., PHILADELPHIA, PA.		
931	†Baugh's Ammoniated Soluble Alkaline,	New Providence Coal Co., New Providence.	7.44
83		Q. W. Luck, Zelienople,	
1235		J. W. Ruff, New Oxford,	
1275	Baugh's Animal Base and Potash Compound for all Crops.	Brillinger & Swartz, Emigsvile,	7.37
1569	Baugh's Balanced Plant Food, A Superior Fertilizer for General Use.	E. Floyd Seeley, Nescopeck,	8.83
659	†Baugh's Complete Animal Bone Fertilizer.	Routch & Swartzel, Clearfield,	8.49
586		J. E. Lunch, Friendsville,	
1219		H. Cooke & Co., Dillsburg,	
82	†Baugh's Excelsior Guano,	O. W. Luck, Zelienople,	8.44
30		Flook Bros., Salladasburg,	
188		J. A. Romberger, Elizabethvile,	
236	†Baugh's General Crop Grower for All Crops.	H. D. & J. F. Bream, Gettysburg,	8.73
185		J. A. Romberger, Elizabethville,	
273		Hogsett & Hawkins, Uniontown,	
1309	†Baugh's Grand Rapids High Grade Guano	James Fulton & Son Co., Stewartstown.	7.08
1874		John Steele, Duncannon, R. No. 4,	
930	Baugh's High Grade Potato Grower,	New Providence Coal Co., New Providence.	9.44
264	Baugh's Peninsula Grain Producer,	H. Cook & Co., Dillsburg,	8.49
582	Baugh's Peruvian Guano (Substitute for Potatoes and all Vegetables.	Ralph Beardslee, Warrenham,	6.67
657	†Baugh's Potato and Truck Special (for all Truck Crops).	Routch & Swartzel, Clearfield,	9.21
583		Ralph Beardslee, Warrenham,	
782		N. F. Reed, New Cumberland,	
274	†Baugh's Special Potato Manure,	Hogsett & Hawkins, Uniontown,	6.24
40		Herman Keebler, Montoursville,	
299		Long & Bunting, Oxford,	
1403	Baugh's Wheat Fertilizer for Wheat and Grass.	H. G. Wright, Canton,	8.54

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
*7.94	8.23	2.32	*10.26	10.94	4.92	-------	4.92	3.00	1.62	1.08	25.92	26.00	1070
*7.70	8.82	2.22	*9.92	10.54	3.34	-------	3.34	3.00	.94	1.00	21.07	21.00	1069
*8.20	9.00	1.36	*9.56	10.91	4.29	-------	*4.29	4.50	1.21	1.00	23.28	30.00	1071
7.68	‡7.00	1.15	8.83	-------	10.69	-------	10.69	10.00	1.46	1.43	30.34	29.00	330
10.36	‡8.00	1.43	11.79	-------	5.01	-------	5.01	5.00	.98	.82	25.32	24.00	328
8.12	‡8.00	1.35	9.47	-------	9.24	-------	*9.24	10.00	*2.48	3.30	33.92	29.00	2033
6.49	6.00	.79	7.28	7.00	6.73	-------	*6.73	8.00	1.58	1.60	25.50	25.50	613
9.15	8.00	.94	10.09	-------	3.01	-------	*3.01	4.00	1.16	.82	22.50	18.50	1220
9.14	8.00	.84	9.98	-------	2.66	-------	2.66	2.00	.44	.41	16.05	16.00	1221
*7.73	8.00	1.52	9.25	9.00	4.69	-------	*4.69	5.00	1.54	1.65	24.90	23.00	1312
17.84	8.00	1.15	8.99	-------	2.38	-------	2.38	2.00	.63	.41	18.37	16.00 21.00 15.00	931 83 1235
8.40	8.00	.52	8.92	-------	2.22	-------	2.22	2.00	1.72	1.65	23.20	21.00	1275
10.81	10.50	.54	11.35	-------	8.80	-------	8.80	7.00	1.57	1.65	31.72	27.00	1569
8.63	8.00	.77	9.40	-------	4.90	-------	4.90	5.00	1.53	1.65	25.65	24.00 23.00 23.00	659 586 1219
8.35	8.00	1.08	9.43	-------	4.18	-------	4.18	4.00	1.07	.82	22.52	25.00 21.85 20.00	82 30 188
9.58	8.00	.31	9.89	-------	1.38	-------	1.38	1.00	.95	.82	20.10	18.50 18.00 20.00	236 185 273
8.10	8.00	.72	8.82	-------	3.34	-------	3.34	3.00	*2.22	2.47	26.46	25.00 26.30	1309 1874
8.81	8.00	1.32	10.13	-------	9.31	-------	*9.31	10.00	3.38	3.30	39.04	36.00	930
7.94	8.00	.89	8.83	-------	2.21	-------	2.21	2.00	1.22	1.00	20.66	18.50	264
7.26	6.00	.77	8.03	-------	7.04	-------	7.04	7.00	*3.48	4.12	35.38	35.00	582
7.61	7.00	.73	8.34	-------	6.98	-------	6.98	7.00	2.83	2.88	32.65	35.00 31.00 32.00	657 589 780
5.62	5.00	1.58	7.20	-------	10.13	-------	10.13	10.00	*1.41	1.65	27.61	27.00 27.00 27.00	274 40 299
8.17	8.00	1.10	9.27	-------	2.50	-------	2.50	2.00	1.66	1.65	23.32	24.00	1403

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*Constituent falls below guaranty. ‡Guaranteed soluble only.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
344	Baugh's Wrapper Leaf Brand (A Special Manure for Seed Leaf Tobacco).	G. Moyer, Mt. Joy,	6.68
1207	Baugh's Export Bone with Potash,	Wm. P. Hay, Somerset, R. F. D. No. 4.	6.24
	THE BERG CO., PHILADELPHIA, PA.		
294	†Berg's High Grade Potato Manure,	B. R. Watson, Oxford,	7.51
213		A. G. Bowman, Palmyra,	
740		J. B. Swigert, Carlisle,	
292	Berg's High Grade Truck Guano,	B. R. Watson, Oxford,	7.37
1765	Berg's S. B. M. Standard Bone Manure,	E. J. Milnor, Hatboro,	7.14
214	†Berg's Tobacco Manure,	A. G. Bowman, Palmyra,	6.34
963		A. B. Groff, New Holand,	
	BOWKER FERTILIZER CO., NEW YORK CITY, N. Y.		
419	†Bowker's Corn and Grain Grower,	A. C. McClure, Burgettstown,	11.87
175		L. G. Landis, Penbrook, R. No. 2,	
514		A. Skelly, Ebensburg,	
1126	†Bowker's Hill and Drill Phosphate,	E. R. Thomas, Springville,	11.39
174		L. G. Landis, Penbrook, R. No. 2,	
1858		Kernochan & Co., Titusville,	
34	Bowker's Ideal Potash Compound,	A. R. Gilmore, Linden,	11.29
1954	Bowker's Market Garden Fertilizer,	H. S. Stultz, Hollidaysburg,	6.33
203	†Bowker's Potash Fertilizer,	L. G. Landis, Penbrook, R. No. 2,	9.78
1955		H. L. Stultz, Hollidaysburg,	
1520	†Bowker's Potash or Staple Phosphate,	C. F. Craig, Sligo,	10.69
421		A. C. McClure, Burgettstown,	
1567		M. M. Harter, Nescopeck,	
176	†Bowker's Potato and Vegetable Fertilizer	L. G. Landis, Penbrook R. No. 2,	12.01
32		A. R. Gilnore, Linden,	
1130		G. A. Crisman, East Rush,	
562	†Bowker's Six Per cent. Potato Fertilizer,	J. G. & W. Campbell, Butler,	8.20
423		A. C. McClure, Burgettstown,	
697		J. A. Bolt, Great Bend,	
1568	†Stockbridge Special Complete Manure for Corn and all Grain Crop.	M. M. Harter, Nescopeck,	10.03
1609		R. A. DeCoursey, Liberty,	
1125	†Stockbridge Special Complete Manure for Potatoes and Vegetables.	E. R. Thomas, Springville,	8.50
1494		W. H. Gerhart, Reinhold, R. D. 2,	
516	†Bowker's Special Crop Grower,	A. Skelly, Ebensburg,	11.01
33		A. R. Gilmore, Linden,	
561		J. G. & W. Campbell, Butler,	
424	†Bowker's Sure Crop Phosphate,	A. C. McClure, Burgettstown,	11.99
204		L. G. Landis, Penbrook, R. No. 2,	
600		A. Bolt, Great Bend,	
	BUFFALO FERTILIZER CO., THE, BUFFALO, N. Y.		
1575	†Fish Guano,	R. C. Bower, Beach Haven,	10.72
1857		H. B. Edwards, Titusville,	
177	Garden Truck,	Russell Byers, Rockville,	10.71
180	High Grade Manure,	Armstrong Bowers, Linglestown,	11.37
1611	†Ideal Wheat and Corn,	Snyder Bros., Liberty,	12.65
1553		W. M. Goss, Dallas,	
1696		Harry Shivery, Bellefonte,	
1554	Vegetable and Potato,	Wm. Goss, Dallas,	10.32
	CAMBRIA FERTILIZER CO., JOHNSTOWN, PA.		
519	Corn and Potato Manure,	A. Skelly, Ebensburg,	7.96
518	Standard Phosphate,	A. Skelly, Ebensburg,	6.97

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pound.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
5.50	3.50	2.37	7.87	-------	3.07	1.76	4.83	5.00	3.27	3.30	31.32	28.00	344
7.35	-------	4.74	12.09	11.00	2.85	-------	2.85	2.00	1.76	1.65	25.06	26.00	1207
7.38	7.00	3.58	10.96	-------	8.20	-------	*8.20	10.00	*2.61	3.00	33.85	35.00 ------ ------	213 294 740
6.89	7.00	2.74	9.63	-------	5.44	-------	*5.44	6.00	*4.50	5.00	38.84	45.00	292
*7.73	8.00	2.81	10.54	-------	3.75	-------	*3.75	6.00	*1.60	3.00	24.78	30.00	1765
10.26	8.00	.51	10.77	-------	4.54	-------	*4.54	6.00	*1.70	3.00	27.49	------ 29.00	214 963
8.45	8.00	1.43	9.88	9.00	4.24	-------	4.24	4.00	.86	.82	21.92	25.00 20.50 22.00	419 175 514
9.20	9.00	1.73	10.93	10.00	2.31	-------	2.31	2.00	2.49	2.47	28.38	27.50 27.00 32.00	1126 174 1858
10.55	10.00	1.20	11.75	11.00	6.13	-------	6.13	6.00	1.13	1.23	27.26	28.00	34
6.24	6.00	1.45	7.69	7.00	11.83	-------	11.83	10.00	2.61	2.47	35.41	35.00	1954
6.36	6.00	1.48	7.84	7.00	2.46	-------	2.46	2.00	.84	.82	17.97	18.00 18.00	203 1955
8.87	8.00	1.76	10.63	9.00	3.96	-------	3.96	3.00	.86	.82	22.23	24.00 26.00 23.00	1520 421 1567
8.54	8.00	1.03	9.57	9.00	4.10	-------	4.10	4.00	*2.15	2.47	27.57	30.00 30.00 34.00	176 32 1130
7.14	6.00	1.49	8.63	7.00	6.11	-------	6.11	6.00	.87	.82	22.52	25.00 28.00 26.00	562 423 697
10.39	10.00	.85	11.24	11.00	6.73	-------	*6.73	7.00	*3.06	3.29	36.21	36.00 36.00	1568 1609
6.31	6.00	1.47	7.78	7.00	9.75	-------	*9.75	10.00	3.28	3.29	36.52	35.00 ------	1125 1494
8.36	8.00	1.48	9.84	9.00	9.89	-------	9.89	10.00	1.51	1.65	30.58	30.00 32.00 35.00	516 33 561
9.11	9.00	1.55	10.66	10.00	2.29	-------	2.29	2.00	.76	.82	20.20	25.50 20.00 25.00	424 204 600
9.10	9.00	1.99	11.09	10.00	2.51	-------	2.51	2.00	1.10	.80	22.22	18.00 22.00	1575 1857
7.86	8.00	1.66	9.52	9.00	7.90	-------	7.90	7.00	3.52	3.30	37.22	30.00	177
7.51	7.00	1.99	9.50	8.00	10.38	-------	10.38	10.00	3.24	3.30	38.42	-------	180
9.20	9.00	1.38	10.58	10.00	5.14	-------	5.14	5.00	1.74	1.60	27.69	23.50 25.00 ------	1611 1553 1693
*7.71	8.00	1.58	9.29	9.00	8.07	-------	8.07	7.00	2.40	2.40	32.07	25.00	1554
7.66	6.00	1.86	9.52	7.00	8.29	-------	8.29	8.00	1.61	1.50	28.86	30.00	519
6.35	6.00	2.47	8.82	7.00	4.47	-------	4.47	3.00	1.56	1.50	23.90	24.00	518

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	CENTRAL CHEMICAL CO., THE, HAGERSTOWN, MD.		
1674	Empire,	Sollenberger & Croft, Fayetteville,	7.32
	CHESAPEAKE CHEMICAL CO., THE, BALTIMORE, MD.		
928	C. C. Co.'s Imperial Guano,	New Providence Coal Co., New Providence.	7.36
1904		Rishel & Kreamer, Jerseytown,	
927	C. C. Co.'s Triumph Guano,	New Providence Coal Co., New Providence.	8.76
	COE-MORTIMER CO., THE, NEW YORK, N. Y.		
2034	Peruvian Vegetable Grower,	G. W. Scott Co., Pittsburg,	10.18
894	E. Frank Coe's Gold Brand Excelsior Guano.	Bottlinger & Scott, Danville,	11.82
	COLUMBIA GUANO CO., BALTIMORE, MD.		
1504	Columbia Fish, Phosphate and Potash,	L. A. Geiger, Joanna,	7.39
717	Truck and Garden Manure,	E. M. Tingley, Kingsley,	7.27
1503	Columbia General Crop Manure,	L. A. Geiger, Joanna,	6.33
716	Columbia Special Potato Formula,	E. M. Tingley, Kingsley,	9.20
1432	†Columbia Special Potato Guano,	A. George & Son, Homer City,	2.54
1502		L. A. Geiger, Joanna,	
	JOSIAH COPE & CO., BALTIMORE, MD.		
1365	†Cope's Ammoniated Phosphate,	Harry Wilson, Frazer,	10.14
1724		J. H. Hershberger, Everett,	
404	†Cope's Potato and Tobacco Phosphate,	Jonas Eavenson, Christiana,	12.12
317		Josiah Cope & Co. (from car), Baltimore, Md.	
1040		J. C. Henderson, Petersburg,	
1920	Cope's Pure Bone Phosphate,	Henry E. Warner, Pennsdale,	9.34
316	Cope's Try Me Fertilizer,	Josiah Cope & Co. (from car), Baltimore, Md.	11.23
1041	†Cope's Universal Mixture for all Crops,	J. C. Henderson, Petersburg,	10.26
403		Jonas Eavenson, Christiana,	
1066		O. H. Kustenbader, Milton,	
	JAMES G. DOWNWARD CO., COATESVILLE, PA.		
835	All Crops Fertilizer,	Jas. G. Downward, Coatesville,	8.56
1764	Ammoniated Phosphate,	E. J. Milnor, Hatboro,	8.45
814	Corn, Wheat and Grass Special,	Hary C. Hibbs, Hulmeville,	11.81
1763	Special Potato Fertilizer,	E. J. Milnor, Hatboro,	8.63
	AMOS EBY & CO., LEAMAN PLACE, PA.		
923	Pequea Ammoniated,	Harvey S. Eby, Refton,	11.39
926	Pequea Economy,	Harvey S. Eby, Refton,	10.78
922	Pequea Valley Fertilizer,	Harvey S. Eby, Refton,	8.88
	EUREKA FERTILIZER CO., THE, BALTIMORE, MD.		
522	†Complete Compound,	A. Skelly, Ebensburg,	9.33
1097		S. A. Hostetler, Belleville,	
452	†Corn and Potato Special,	Raymond Wagner, Snedburg,	11.05
43		D. J. Shock, Montoursville,	
616		A. N. Witter, Waterfall,	

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†Composite sample.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
*7.54	8.00	.62	*8.16	9.00	9.34	-------	*9.34	10.00	*1.45	1.65	28.54	27.00	1674
8.82	8.00	1.29	10.11	9.00	2.83	-------	2.83	2.00	.51	.41	16.39	15.50 15.00	928 1904
8.30	8.00	1.10	9.40	9.00	10.42	-------	10.42	10.00	1.83	1.64	32.49	28.00	927
7.94	8.00	1.52	9.46	9.00	1.20	8.46	9.66	9.00	3.14	3.30	39.34	-------	2034
7.90	8.00	2.17	10.07	9.00	6.07	-------	6.07	6.00	2.52	2.47	31.06	30.00	894
7.81	8.00	1.31	9.12	8.50	3.19	-------	3.19	3.00	1.67	1.65	23.77	20.00	1504
*7.04	8.00	2.83	9.87	8.50	7.99	-------	7.99	7.00	3.56	3.29	37.30	29.00	717
7.75	8.00	.88	8.63	8.50	4.26	-------	4.26	4.00	.73	.82	20.49	19.00	1503
*7.55	8.00	1.84	9.39	8.50	9.81	-------	9.81	10.00	1.54	1.65	30.06	24.75	716
5.36	5.00	1.12	6.48	5.50	10.08	-------	10.08	10.00	1.71	1.65	28.45	28.00 23.00	1432 1502
8.06	8.00	1.72	9.78	9.00	3.31	-------	3.31	3.00	.86	.82	20.72	22.00 23.00	1365 1724
10.71	10.00	1.15	11.86	11.00	6.19	-------	*6.19	7.00	.92	.82	26.30	26.00 22.00 23.50	401 317 1040
10.94	9.00	3.02	13.96	13.50	4.47	-------	4.47	4.00	1.87	1.85	29.78	24.00	1920
8.73	8.00	1.11	9.84	9.00	4.13	-------	4.13	4.00	1.66	1.65	25.62	22.00	316
8.12	8.00	1.07	9.19	9.00	8.45	-------	*8.45	10.00	.43	-------	23.89	------ 21.00 24.00	1041 403 1066
6.96	7.00	.97	7.93	8.00	4.48	-------	4.48	3.00	.46	.41	18.60	22.00	835
8.03	7.00	.97	9.00	8.00	3.84	-------	3.84	3.50	1.11	.82	22.00	25.00	1764
7.72	7.00	1.13	8.85	-------	4.20	-------	4.20	3.50	1.47	1.65	23.71	29.00	814
7.87	7.00	.75	8.62	8.00	5.59	-------	5.59	5.00	1.16	1.24	23.72	29.00	1763
10.56	10.00	2.07	12.63	12.00	2.91	-------	2.91	2.00	1.03	.82	23.92	20.00	923
8.99	9.00	2.87	11.86	11.00	3.24	-------	3.24	2.50	1.87	1.65	26.92	24.00	926
8.60	8.00	2.13	10.73	9.00	9.43	-------	*9.43	10.00	1.74	1.65	31.82	28.00	922
7.75	7.00	2.28	10.03	8.00	5.22	-------	5.22	5.00	.80	.82	22.36	22.00 21.50	522 1097
*8.10	9.00	1.59	9.69	-------	3.50	-------	3.50	3.00	.76	.82	20.43	19.90 21.00 22.00	452 43 616

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
68	†Fish and Potash,	L. Arnold, Pfouts Valley,	10.79
453		Raymond Wagner, Snedburg,	
862	†Grain and Grass Mixture,	Wm. Davis, Jr., Greensboro,	10.21
774		D. J. Beitzel, Mechanicsburg, R. D.,	
1059		L. Arnold, Pfouts Valley,	
193	†High Grade Trucker,	L. Arnold, Liverpool,	9.37
178		Armstrong Bowers, Linglestown,	
906		W. F. Slagle, Bloomsburg,	
1311	Imperial Phosphate,	J. H. Bertenslager, Stewartstown,	9.86
179	†Potato and Vegetable Fertilizer,	Armstrong Bowers, Linglestown,	10.12
773		D. J. Beitzle, Mechanicsburg,	
	FARMERS' FERTILIZER WORKS, ELZIABETHTOWN, PA.		
190	†Grain and Grass Special,	John Sheets, Elizabethville,	9.12
361		W. F. Groff, Lititz,	
1072	†Potato, Tobacco and Truck Manure,	I. L. Luck, Selinsgrove,	8.94
348		H. S. Newcomer, Mt. Joy,	
1800		B. F. Horting, Newport,	
354	Pride of Donegal,	H. S. Newcomer, Mt. Joy,	8.05
349	Special Potato and Tobacco Manure,	H. S. Newcomer, Mt. Joy,	9.26
	W. S. FARMER & CO., BALTIMORE, MD.		
1308	W. S. Farmer & Co.'s Pelican Guano,	D. J. Trout, Stewartstown,	8.92
	GRIFFITH & BOYD CO., BALTIMORE, MD.		
238	Cereal Plant Food,	H. J. Van Dyke, Gettysburg, R. D. No. 6.	7.69
358	†Double Strength Tobacco Grower,	Bear & Long, Lititz,	7.55
1924		S. A. Glosser, Linden,	
60	†Farmer's Improved Phosphate,	B. F. Gayman, Thompsontown,	9.31
1274		G. H. Wolf's Sons, Mt. Wolf,	
85	†Farmer's Potato Manure,	Harmony Cereal Mills, Harmony,	10.36
36		S. A. Glosser, Linden,	
300		Passmore & Co., Nottingham,	
731	†Gilt Edge Crop Guano,	Wm. H. Beckert, Bakerstown,	8.99
359		Bear & Long, Lititz,	
901		E. D. Tewksbury, Catawissa, R. D. 5	
	FRANK HARTRANFT, COATESVILLE, PA.		
821	Potato Phosphate,	Preston Powell, West Grove,	11.12
822	Special Phosphate,	Preston Powell, West Grove,	10.97
	W. D. HASTINGS & SON, ATGLEN, PA.		
313	Atglen Brand,	W. S. Hastings & Son, Atglen,	6.56
	S. M. HESS & BRO., INC., PHILADELPHIA, PA.		
680	Jumbo Complete Formula,	J. R. Iddings, Mifflinburg, R. F. D.,	10.92
31	†Keystone Phosphate,	Wm. Bardo, Larrysville,	12.25
24		Jacob Kimmel, Valley View,	
59		W. W. Book, Port Royal,	
117	Potato and Truck Manure,	J. T. Masey, Allentown,	10.56
482	†Special Compound,	H. E. Shipman, Hughesville, R. D. 3	11.91
379		Benj. Weidener, Lititz, R. D. 2,	
1171		W. J. Newhart, Saylorsburg, R.F.D.1	
378	†Special Corn Manure,	Benj. Weidner, Lititz,	12.05
109		H. F. Troxell, Allentown, R. D. 4,	
481		H. E. Shipman, Hughesville,	

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pound.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
9.70	8.00	1.90	11.60	9.00	1.06	-------	1.06	1.00	.50	.41	18.56	20.00 18.00	68 453
8.38	8.00	2.07	10.45	9.00	2.44	-------	2.44	2.00	1.00	.82	21.01	------ 19.00 17.00	832 774 1059
8.56	8.00	1.93	10.49	-------	9.69	-------	*9.69	10.00	1.58	1.65	31.23	------ ------ 35.00	193 178 905
8.11	8.00	1.76	9.87	9.00	2.53	-------	2.53	1.00	.80	.82	19.76	17.00	1311
9.67	8.00	.84	10.51	9.00	4.93	-------	4.93	4.00	*1.38	1.65	26.08	------ 24.00	179 773
*7.38	8.00	1.28	8.66	-------	4.38	-------	4.38	4.00	.83	.82	20.89	20.00 20.00	190 361
9.86	10.00	.85	10.71	-------	5.33	.99	6.32	6.00	2.30	2.47	32.01	------ 26.50 28.00	1072 348 1800
8.05	7.00	1.40	9.45	-------	4.27	1.53	5.80	5.00	1.86	1.65	28.00	22.50	354
6.82	6.00	.96	7.78	-------	4.27	3.17	*7.44	10.00	*2.16	2.47	29.95	30.00	349
6.44	6.00	.71	7.15	7.00	2.61	-------	*2.61	3.00	.81	.41	17.61	17.00	1308
7.95	8.00	2.31	10.26	9.00	2.38	-------	2.38	2.50	.82	.85	19.23	21.00	238
8.51	8.00	2.68	11.19	9.00	2.41	-------	*2.41	3.00	*2.26	2.50	27.08	27.00 28.00	358 1924
7.41	7.00	2.66	10.07	8.00	2.34	-------	2.34	2.00	*.74	.85	19.04	------ 18.65	60 1274
9.74	8.00	.80	10.54	9.00	8.10	-------	*8.10	9.00	.81	.85	26.65	27.00 ------ 25.00	85 33 300
7.94	8.00	2.45	10.39	9.00	8.80	-------	*8.80	10.00	1.61	1.65	29.96	29.00 30.00 20.00	731 359 901
8.25	8.00	.74	*8.99	10.00	6.96	-------	*6.96	8.00	.93	.82	24.60	27.00	821
*7.94	10.00	1.75	*9.69	11.00	2.65	-------	2.65	2.00	*.63	.82	19.02	21.00	822
*5.52	8.00	4.56	10.08	-------	5.46	-------	5.46	5.00	1.54	1.65	24.87	23.00	313
7.44	7.00	1.08	8.52	8.00	2.37	-------	2.37	1.00	1.14	.82	20.68	-------	680
8.67	8.00	1.08	9.75	9.00	1.36	-------	1.36	1.00	.96	.82	19.46	------ 22.00 22.00	31 24 59
8.02	8.00	1.57	9.59	9.00	6.42	-------	6.42	6.00	*2.14	2.47	29.68	32.50	117
8.07	8.00	1.06	9.13	9.00	4.56	-------	4.56	4.00	1.14	.82	23.06	19.50 24.00 23.00	482 379 1171
8.36	8.00	1.93	9.29	9.00	2.40	-------	2.40	2.00	.93	.82	20.64	21.00 21.50 18.00	378 109 481

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
377	†Superior Potash Mixture,	Benj. Weidener, Lititz,	9.57
1821		J. D. Cooper, Landisburg,	
	HUBBARD FERTILIZER CO., THE, BALTIMORE, MD.		
221	†Hubbard's Climax Phosphate,	J. B. Spera, Dillsburg,	6.65
182		J. A. Romberger, Elizabethville,	
483		J. P. Hill, Muncy, R. D. 1,	
220	†Hubbard's Columbia Jem Phosphate,	I. B. Spera, Dillsburg,	7.86
187		J. A. Romberger, Elizabethville,	
499		E. J. Otto, Red Cross,	
536	†Hubbard's Farmer's I. X. L.,	Wesley Seltzer, Orwigsburg,	7.79
500		E. J. Otto, Red Cross,	
990		J. A. Umble & Bro., Bird-in-Hand,	
863	†Hubbard's Jersey Trucker,	T. M. Smith, Jefferson,	9.17
501		E. J. Otto, Red Cross,	
988		J. A. Umble & Bro., Bird-in-Hand,	
989	†Hubbard's Jewel Phosphate,	J. A. Umble & Bro., Bird-in-Hand,	6.29
1551		J. I. Thompson, Lemont,	
	M. P. HUBBARD & CO., BALTIMORE, MD.		
1297	Hubbard's Celebrated Phosphate for General Use.	Geo. B. Murphy, Red Lion, R. D. 1,	6.29
1298	†Excelsior Phosphate,	Geo. B. Murphy, Red Lion, R. D. 1,	10.97
1628		J. P. Suchart, New Freedom,	
243	Hubbard's Farmer's Acme,	Biglerville Warehouse Co., Biglerville	8.52
	INTERNATIONAL SEED CO., Rochester, N. Y.		
1842	A. I. Special Manure,	F. H. Fowler, Linesville,	12.18
1122	International Potato and Truck Manure,	D. Fulkerson, Sugar Grove,	13.38
	JARECKI CHEMICAL CO., SANDUSKY, OHIO.		
1512	†Fish Phosphate and Potash, Tobacco and Potato Food.	Clark Bros., Oil City,	9.66
1445		R. S. Rommel, Enon Valley, R. D.,	
1837		David Garloch, North Girard,	
1218	†Lake Erie Guano with Phosphate and Potash.	S. S. Mosholder, Rockwood, R. F. D. 3.	7.55
1456		G. H. Cornell, Edinboro,	
415	Number One Formula,	J. M. Raab & Bro., Midway,	10.53
1454	Tobacco and Truck Grower,	G. H. Cornell, Edinboro,	9.76
	KEYSTONE BONE FERTILIZER CO., PHILADELPHIA, PA.		
1755	Keystone Corn and Cereal Grower,	Wm. M. Holbert, Warrington,	9.04
1650	Keystone Economy Potash Compound,	L. A. Gieger, Joanna,	9.88
1161	†Keystone Standard Potato Manure,	J. E. Houck, Catawissa, R. D.,	11.44
1769		W. S. Buckman, Hatboro,	
1355	†Keystone 20th Century Special,	Henry Rinehart, New Ringgold, R. D.	8.71
1658		N. E. Dietrick, Reading,	
638	†Keystone Vegetable Guano,	W. O. Minich, Cherryville,	10.32
447		A. C. Oswald, Coplay, R. D.,	
1651		L. A. Geiger, Joanna,	
	LANCASTER BONE FERTILIZER CO., LANCASTER, PA.		
604	Complete Am. Bone Manure,	Daniel Replogle, Woodbury,	8.02
673	†Potato, Fruit and Vegetable,	J. W. Garman, Richfield,	5.72
507		Wm. B. Rowland, Ebensburg, R.D.2	
1012		Frank Knorr, Conyngham,	

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
8.68	8.00	.84	9.52	9.00	9.90	-------	9.90	10.00	*1.40	1.65	30.18	30.00 29.00	377 1821
*6.54	7.00	1.66	8.20	8.00	4.84	-------	4.84	4.00	.85	.82	20.70	19.00 19.00 18.00	221 182 483
9.63	8.00	1.91	10.54	9.00	2.58	-------	2.58	2.00	.45	.41	16.74	16.00 16.00 17.00	220 187 499
8.45	8.00	1.81	10.26	9.00	2.37	-------	2,37	2.00	1.61	1.64	23.58	19.50 21.00 22.00	536 500 990
8.99	8.00	1.34	10.33	9.00	8.06	-------	*8.06	10.00	1.60	1.64	29.73	31.00 28.00 27.00	863 501 983
*7.56	8.00	1.43	8.99	9.00	6.13	-------	6.13	5.00	1.14	1.00	24.32	22.00 ------	989 1551
8.24	8.00	.57	*8.81	9.50	2.46	-------	2.46	2.00	2.12	1.66	25.15	20.00	1297
8.96	8.00	.69	9.65	9.50	2.62	-------	2.62	2.00	.99	.83	21.08	17.00 17.00	1298 1623
8.72	8.00	.55	*9.27	9.50	4.22	-------	4.22	4.00	.96	.83	22.16	21.00	243
6.06	6.00	.66	*6.72	7.00	10.86	-------	10.86	10.00	2.43	2.47	33.12	33.40	1842
8.06	8.00	.82	8.88	9.00	7.00	-------	7.00	7.00	1.45	1.23	26.80	29.00	1122
8.35	8.00	.73	9.08	9.00	3.91	-------	3.91	4.00	.82	.83	20.91	26.00 22.00 24.00	1512 1445 1837
*7.80	8.00	1.57	9.37	9.00	2.38	-------	2.38	2.50	1.20	1.25	21.04	21.00 23.00	1218 1456
8.40	8.00	1.36	9.76	9.00	1.81	-------	1.81	2.00	.88	.83	19.56	22.00	415
*5.64	6.00	.96	*6.60	7.00	6.23	-------	6.33	6.00	1.60	1.66	24.28	27.00	1454
*7.33	8.00	1.04	*8.37	9.00	4.69	-------	4.69	4.00	1.70	1.65	24.91	27.00	1755
7.39	7.00	.64	8.03	8.00	5.97	-------	5.97	5.00	.73	.82	21.75	21.00	1650
7.49	6.00	.48	7.97	7.00	9.71	-------	*9.71	10.00	2.76	2.47	34.74	29.50 31.00	1161 1769
6.59	5.00	.65	7.24	6.00	12.18	-------	12.18	10.00	1.10	1.23	28.90	24.00 26.00	1355 1658
7.78	6.00	.60	8.38	7.00	7.36	-------	7.36	6.00	1.63	1.65	27.67	26.00 ------ 25.00	638 447 1651
8.14	8.00	.78	8.92	9.00	2.42	-------	2.42	2.00	.80	.82	19.20	21.00	604
7.27	7.00	.32	*7.59	8.00	7.60	-------	7.60	7.00	*.55	.82	22.20	23.00 24.00 24.00	673 507 1012

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
508	†Potato, Tobacco and Truck Manure,	Wm. R. Rowland, Ebensburg, R. D. 2.	8.84
1776		Aaron Vogt, Lebanon, R. No. 1,	
898	†Special Guano,	H. E. Bahner, Catawissa, R. D. 5,	7.96
1288		Josiah Flinchbaugh, Windsor,	
	LANCASTER CHEMICAL CO., THE, LANCASTER, PA.		
51	No. 1 Tobacco and Vegetable,	C. S. Winey, McAllisterville,	7.34
1000		H. C. Breckbill, Strasburg,	
968	No. 2 Dewey Brand,	I. B. Myer, Leola,	6.22
969	No. 4 Rising Sun Animal Bone,	I. B. Myer, Leola,	8.59
999	No. 6 Hard Times Fertilizer,	H. C. Breckbill, Strasburg,	8.33
49	†No. 11 Keystone Brand,	C. S. Winey, McAllisterville,	9.89
173		M. H. Witmeyer, Lebanon,	
	LEBANON FERTILIZER WORKS, LEBANON, PA.		
1342	†Levan's Lebanon Special Fertilizer,	Frank Gerhart, Orwigsburg,	8.31
1787		J. M. Groh, Lickdale,	
215	Levan's Special Potato and Tobacco,	A. B. Bomgardner, Palmyra,	7.54
1341	†Levan's Special Truck Fertilizer,	Frank Gerhart, Orwigsburg,	7.16
2		Horace Kintzel, Pine Grove, R. D.,	
1786		J. M. Groh, Lickdale,	
172	†Levan's Wheat and Grass Fertilizer,	M. L. Bachman, Lebanon,	6.38
1477		D. C. Ney, Jonestown,	
342	Levan's Wheat and Grass Special Fertilizer,	Sol Brinser, Middletown, R. D.,	8.54
	LISTER AGRICULTURAL CHEMICAL WORKS, NEWARK, N. J.		
1362	Lister's Corn No. 2 Fertilizer,	D. W. Kleckner, New Ringgold, R. D.	9.33
876	†Lister's G. Brand,	D. W. Bartz, Greensburg,	10.86
372		Levi Tirgler, Lititz, R. D. 2,	
1144		N. J. Norton, New Albany,	
736	†Lister's Harvest Queen Phosphate,	R. M. Bowser & Son, Renfrew,	11.34
496		A. J. Smith, Paxinos, R. D.,	
752		Allison & Foglesonger, Shippensburg,	
914	†Lister's New York Special Fertilizer,	B. F. Walters, Christiana,	10.91
738		R. M. Bowers & Son, Renfrew,	
1049		H. P. Harpster, Warriors Mark,	
1099	†Lister's Potato and Corn No. 2 Fertilizer,	J. M. Zook, Belleville,	11.65
371		Levi Tirgler, Lititz, R. D. 2,	
1450		P. C. Harned, Edinboro,	
812	†Lister's Potato Manure,	W. E. Ervin, Somerton,	12.19
375		Levi Tirgler, Lititz, R. D. 2,	
878		D. W. Bartz, Greensburg,	
1004	Lister's Potato No. 2 Fertilizer,	Ed. Hilliard, Conyngham,	12.09
751	†Lister's Special Crop Producer,	Allison & Foglesonger, Shippensburg,	9.05
611		D. B. Griffith, Wolfsburg, R. D.,	
879		D. W. Bartz, Greensburg,	
370	†Lister's Special 10% Potato Fertilizer,	Levi Tirgler, Lititz, R. D. 2,	10.92
336		W. E. Erwin, Somerton,	
708		C. H. Van Gorder, Gibson,	
373	Lister's Special Tobacco Fertilizer,	Levi Tirgler, Lititz, R. D. 2,	9.81
1149	†Lister's Success Fertilizer,	Zehner Bros., Bloomsburg,	7.74
1836		R. S. Carter, Harbor Creek,	
565	†Lister's 3-6-10 for Potatoes,	Morow & Buxton, Valencia,	9.37
376		Levi Tirgler, Lititz, R. D. 2,	
771		Miller & Enrich, Mechanicsburg,	
567	†Lister's U. S. Superphosphate,	Morrow & Buxton, Valencia,	10.79
497		Daniel Lahr, Dornsife,	
1075		G. N. Erdley, Selinsgrove,	

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
9.04	8.00	.56	9.60	9.00	7.81	-------	7.81	8.00	1.73	1.65	29.83	29.00 28.00	508 1776
6.83	7.00	1.84	8.67	8.00	4.11	-------	4.11	4.00	1.02	.82	21.02	20.00 21.00	898 1288
*5.99	7.50	2.55	8.54	8.50	1.70	6.25	7.95	7.00	2.19	2.06	31.39	29.70 31.00	51 1000
*7.42	8.00	1.95	9.37	9.00	2.00	1.92	3.92	4.00	1.31	1.23	23.24	22.50	968
*8.35	10.00	2.44	*10.79	11.00	2.26	-------	2.26	2.00	2.44	2.47	27.63	26.50	969
*7.00	8.00	1.99	8.99	9.00	2.02	-------	2.02	2.00	.61	.41	17.28	18.00	999
6.84	7.00	1.99	8.83	8.00	2.19	-------	2.19	1.00	*.71	.82	17.78	17.50 ------	49 173
*7.23	8.00	1.53	*8.76	9.00	3.07	-------	3.07	2.00	*1.84	2.06	24.06	18.75 21.00	1342 1787
*7.77	8.00	1.42	9.19	9.00	5.66	-------	*5.66	6.00	1.82	1.65	27.00	24.00	215
7.42	7.00	.66	8.08	8.00	9.91	-------	9.91	10.00	1.74	1.65	30.39	24.50 25.00 27.00	1341 2 1786
*6.83	8.00	1.66	*8.49	9.00	5.18	-------	5.18	5.00	.94	.82	21.81	20.00 20.00	172 1477
7.87	8.00	1.56	9.43	9.00	2.09	-------	2.09	1.50	1.27	1.23	21.06	19.00	342
10.21	10.00	2.09	12.30	11.00	4.52	-------	4.52	4.00	1.53	1.65	27.48	24.00	1362
*7.69	8.00	1.62	9.31	9.00	4.17	-------	4.17	4.00	1.07	.82	22.05	28.00 21.00 25.00	876 372 1144
9.02	9.00	1.75	10.77	10.00	2.38	-------	2.38	2.00	1.24	1.23	22.57	25.00 21.00 21.00	736 493 752
7.99	8.00	1.14	9.13	9.00	10.60	-------	10.60	10.00	.99	.82	28.48	23.50 29.00 27.50	914 738 1049
10.39	10.00	1.77	12.16	11.00	4.44	-------	4.44	4.00	1.56	1.65	27.45	24.50 25.00 27.00	1099 371 1450
7.97	8.00	2.08	10.05	9.00	7.05	-------	7.05	7.00	3.32	3.29	35.76	33.00 34.00 45.00	812 375 878
10.16	10.00	1.80	11.96	11.00	4.19	-------	4.19	4.00	1.52	1.65	33.92	-------	1004
7.15	7.00	1.28	8.43	8.00	1.21	-------	1.21	1.00	1.09	.82	18.58	17.50 18.00 28.00	751 611 879
7.95	8.00	2.32	10.27	9.00	10.92	-------	10.92	10.00	*1.39	1.65	31.12	28.00 29.00 33.00	370 336 708
8.12	8.00	2.49	10.61	9.00	2.66	.23	2.89	3.00	2.24	2.06	27.14	24.50	373
*8.78	9.00	1.80	10.58	10.00	2.39	-------	2.39	2.00	1.29	1.23	22.62	24.00 26.00	1149 1836
5.98	6.00	2.36	8.34	7.00	10.86	-------	10.86	10.00	2.46	2.47	33.88	34.00 30.50 33.00	565 376 771
8.16	8.00	1.55	9.71	9.00	2.26	-------	2.26	2.00	1.01	1.03	20.31	23.50 20.00 17.50	567 497 1075

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	FREDERICK LUDLAM CO., BALTIMORE, MD.		
1271	Ludlam' Cecrops Fertilizers, Harvest Queen.	Emanuel Hoffman, East Berlin,	8.38
1545		Joshua Potter, Center Hall,	
650	Ludlam's Cecrops Fertilizer's, Potato and Tobacco.	Geo. Rafferty, Grampian,	10.48
755		John P. Wadel, Shippensburg,	
956	Ludlam's Cecrops Fertilizers, Spring Special.	W. D. Hess, Quarryville,	10.52
224	Ludlam's Cecrops Fertilizers, Standard,	Amos F. Bushey, York Springs, R. D. 2.	11.12
957	†Ludlam's Cecrops Fertilizers, Standard Potash.	W. J. Hess, Quarryville,	10.78
1819		Peter Zirfing, New Bloomfield,	
	MAPES FORMULA AND PERUVIAN GUANO CO., NEW YORK CITY, N. Y.		
369	†Mapes' Average Soil Complete Manure,	W. H. Muth & Co., Lititz,	5.19
886		W. H. Diehl, Northumberland, R. D.	
889	Mapes' Economical Potash Manure,	W. H. Diehl, Northumberland, R. D.	5.10
366	†Mapes' Economical Potato Manure,	W. H. Muth, Lititz,	4.88
815		John B. Satterthwaite, Woodbourne,	
367	Mapes' General Crop Brand,	W. H. Muth, Lititz,	5.70
816	†Mapes' Potato Manure,	John B. Satterthwaite, Woodbourne,	3.56
530		A. F. Kimmel, Orwigsburg,	
1619		Kelley & Rerwan, Blossburg,	
368	†Mapes' Tobacco Manure, Wrapper Brand,	W. H. Muth & Co., Lititz,	7.30
890		W. H. Diehl, Northumberland, R. D.	
529	Mapes' Top Dresser Improved (Full Strength).	A. F. Kimmel, Orwigsburg,	5.91
	N. MARKEL, SEITZLAND, PA.		
1305	Markel's Electric Phosphate,	D. J. Trout, Stewartstown,	7.12
	D. B. MARTIN CO., PHILADELPHIA, PA.		
399	Martin's Bull Head Fertilizer for Cotton and Tobacco.	Lancaster Co. Farmers' Assn., Manheim, R. D.	11.39
383	†Martin's Corn and Cereal Special,	E. K. Brubaker, Lititz, R. D. 2	11.21
5		John K. Miller, Summit Station,	
1133		S. G. Cook, Potterville,	
431	Martin's Early Truck and Vegetable Grower.	A. E. Walker, Burgettstown,	7.94
381	Martin's Claremont Vegetable Grower,	E. R. Brubaker, Lititz,	10.67
533	†Martin's Gilt Edge Potash Manure,	A. F. Kimmel, Orwigsburg,	8.16
382		E. R. Brubaker, Lititz,	
1629		H. W. Rehmeyer, Turnpike,	
153	†Martin's 1-8-4,	Ed. Houck, Bangor,	10.98
8		John K. Miller, Summit Sta.,	
398		Lancaster Co. Farmers' Asson., Manheim, R. D.	
150	†Martin's Prize Potato,	Ed Houck, Bangor,	10.71
7		John K. Miller, Summit Sta.,	
395		Lancaster Co., Farmers' Assn., Manheim, R. D. 1.	
397	†Martin's Special Compound,	Lan. Co. Farmers' Assn., Manheim, R. D.	10.66
262		H. Cook & Co., Dillsburg,	
429		A. E. Walker, Burgettstown,	
428	†Martin's Special Potato Manure,	A. E. Walker, Burgettstown,	10.11
216		Lebanon Hdw. Co., Lebanon,	
828		H. A. Mendenhall, Toughkenamon,	
427	†Martin's Sure Grower,	A. E. Walker, Burgettstown,	10.39
149		Ed. Houck, Bangor,	
1324		H. B. Low & Son, Orangeville,	

†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
8.70	8.00	1.28	9.98	9.00	2.21	-------	2.21	2.00	.77	.82	19.57	18.65 19.40	1271 1545
8.65	8.00	1.01	9.66	9.00	10.61	-------	10.61	10.00	1.63	1.65	32.04	29.15 28.00	650 755
9.43	9.00	1.28	10.71	10.00	7.46	-------	7.46	7.00	.96	.82	26.56	24.00	956
7.98	8.00	1.39	9.37	9.00	4.50	-------	*4.50	5.00	1.79	1.65	25.99	22.00	224
8.43	8.00	.94	9.37	9.00	4.30	-------	4.30	4.00	.93	.82	22.20	22.00 22.00	957 1819
7.21	7.00	1.29	8.50	-------	4.93	.83	5.76	5.00	3.94	4.12	36.44	36.00 40.00	369 886
3.95	-------	2.55	6.50	-------	2.66	5.76	8.42	-------	3.42	-------	35.11	40.00	889
5.09	4.00	1.58	6.67	6.00	2.66	5.42	8.08	8.00	3.47	3.29	35.65	36.00 37.00	366 815
8.24	8.00	2.00	10.24	10.00	2.27	-------	2.27	2.00	*1.45	1.65	22.68	23.50	367
8.26	8.00	1.39	9.65	9.00	6.66	1.23	7.89	6.00	3.70	3.71	37.18	40.00 40.00 42.00	816 530 1619
3.87	-------	1.10	4.97	4.50	5.73	5.68	11.41	10.50	*5.93	6.18	48.97	48.00 50.00	368 890
5.48	5.00	2.26	*7.74	8.00	2.53	1.78	4.31	4.00	10.06	9.88	61.74	53.00	529
10.16	9.00	.68	10.84	10.00	2.22	-------	2.22	2.00	.53	.41	16.71	18.00	1305
8.35	8.00	.99	9.34	-------	3.26	-------	3.26	3.00	2.55	2.47	28.34	22.00	399
8.52	8.00	.98	9.50	-------	2.27	-------	2.27	2.00	1.64	1.65	23.37	19.60 21.00 20.00	383 5 1133
7.50	6.00	.85	8.35	-------	7.92	-------	7.92	8.00	*2.76	3.30	33.07	31.50	431
7.90	7.00	1.02	8.92	-------	5.50	-------	5.50	5.00	2.61	2.47	30.42	24.60	381
7.84	7.00	.64	8.48	-------	10.99	-------	10.99	10.00	2.29	2.47	34.42	30.00 28.60 29.00	533 382 1629
8.58	8.00	.57	9.15	-------	4.31	-------	4.31	4.00	.94	.82	22.16	20.50 20.00 16.75	153 8 398
8.72	8.00	.59	9.31	-------	5.20	4.46	*9.66	10.00	1.84	1.65	32.91	27.50 30.00 24.50	150 7 395
8.37	8.00	1.19	9.56	-------	5.12	-------	5.12	5.00	1.71	1.65	26.46	20.50 22.50 27.50	397 262 429
7.83	8.00	.81	8.64	-------	4.94	-------	4.94	5.00	.79	.82	21.49	24.50 18.50 22.00	428 216 828
8.62	8.00	.74	9.36	-------	1.49	-------	1.49	1.00	.79	.82	18.72	21.00 16.50 16.00	427 149 1324

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*Constituent falls below guaranty.

COMPLETE FERTI

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	MEDICUS FERTILIZER CO., PHILADELPHIA, PA.		
2030	Blood, Bone and Potash,	W. S. Buckman, Hatboro,	13.56
1768	Corn and Potato Manure,	W. S. Buckman, Hatboro,	12.46
1772	Grain and Grass,	W. S. Buckman, Hatboro,	26.35
1767	Vegetable Guano,	W. S. Buckman, Hatboro,	7.63
	FREDERICK MEEHRING, BRUCEVILLE, MD.		
1243	General Crop Grower,	J. N. Slifer, Littlestown,	10.57
1244	Twenty-Six Dollar Phosphate,	J. N. Slifer, Littlestown,	11.01
	MILLER FERTILIZER CO., BALTIMORE, MD.		
363	†Farmer's Profit,	W. H. Muth & Co., Lititz,	7.87
297		M. T. Harkins, Hickory Hill,	
1254		Charles Carbaugh, Hanover, R. D. 5	
364	†Harvest Queen Phosphate,	W. H. Muth & Co., Lititz,	9.47
241		Biglerville Warehouse Co., Biglerville.	
1287		Wm. Overdorf, Windsor, R. D. 1,	
775	†Hustler Phosphate,	J. R. Miller Sons, New Kingston,	8.52
1286		Wm. Overdorf, Windsor, R. D. 1,	
242	Pimlico,	Biglervile Warehouse Co., Biglerville.	7.77
776	†Potato and Vegetable Grower,	J. R. Miller, New Kingston,	8.89
1253		Charles Carbaugh, Hanover, R D. 5,	
365	†Special Tobacco Grower,	W. H. Muth & Co., Lititz,	7.91
1625		J. P. Suchart, New Freedom,	
295	Standard Phosphate,	M. T. Harkins, Hickory Hill,	5.59
296	†W. G. Phosphate,	M. T. Harkins, Hickory Hill,	7.36
1626		J. P. Suchart, New Freedom,	
	NASSAU FERTILIZER CO., NEW YORK, N. Y.		
1180	Common Sense Potato Manure,	Geo. L. Nyce, Bushkill,	13.14
1093	†General Favorite,	J. D. Graybill & Sons, Bellville,	10.42
685		C. F. Snyder & Son, Mifflinburg,	
1276		Brillinger & Swartz, Emigsville,	
480	†Gladiator Truck and Potato,	C. J. Ford, LeRaysville,	7.59
1490		Pharos L. Brubaker, Ephrata, R. D. 2.	
589	Old Hickory,	Edward Jones, Fairdale,	10.17
778		J. H. Koller, Mechanicsburg,	
777	†Special Potato Fertilizer,	J. H. Koller, Mechanicsburg,	11.19
479		C. J. Ford, LeRaysville,	
1179		Geo. L. Nyce, Bushkill,	
	G. OBER & SONS CO. OF BALTIMORE CITY, BALTIMORE, MD.		
1635	Ober's Overland Special Mixture,	J. W. Glatfelter, Rossville,	9.86
1413	Ober's Special Plant Food,	S. J. Lonther, Carroltown,	9.51
1282	†Ober's Stag Guano,	Jonathan Geesey & Son, Dallastown,	11.98
1700		J. H. Neese, Bellefonte, R. F. D.,	
	PATAPSCO GUANO CO., BALTIMORE, MD.		
73	†Coon Brand Guano,	G. A. Harley, Warrendale,	11.87
52		W. E. Harley, Thompsontown,	
210		Jos. Berkholder, Hummelstown,	

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds. Total. Found.	Phosphoric Acid in 100 Pounds. Total. Guaranteed.	Phosphoric Acid in 100 Pounds. Insoluble.	Phosphoric Acid in 100 Pounds. Available. Found.	Phosphoric Acid in 100 Pounds. Available. Guaranteed.	Potash in 100 Pounds. Present as muriate.	Potash in 100 Pounds. Present as sulphate.	Potash in 100 Pounds. Total. Found.	Potash in 100 Pounds. Total. Guaranteed.	Nitrogen in 100 lbs. Found.	Nitrogen in 100 lbs. Guaranteed.	Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
*6.42	8.00	1.57	*7.99	9.00	10.96	-------	10.96	10.00	*2.65	3.28	34.98	-------	2030
*7.51	8.00	2.68	10.19	9.00	8.70	-------	*8.70	10.00	1.47	1.64	28.84	26.00	1768
8.38	7.00	2.86	11.24	8.00	1.12	-------	1.12	1.00	.88	.82	17.57	18.00	1772
6.39	6.00	3.10	9.40	7.00	5.90	-------	5.90	6.00	1.65	1.64	25.96	24.00	1767
10.16	10.00	4.54	14.70	11.00	2.14	-------	2.14	1.15	.88	.82	19.65	17.00	1243
11.39	11.00	5.57	16.96	12.00	1.92	-------	1.92	1.50	1.38	1.23	27.02	19.00	1244
8.30	8.00	.41	8.71	8.50	5.33	-------	5.33	5.00	.96	.83	22.86	22.00 24.00 22.00	366 297 1254
9.39	9.00	.50	9.89	9.50	3.08	-------	3.08	2.75	1.11	1.03	22.41	21.50 21.00 20.00	364 241 1287
8.41	8.00	.97	9.38	8.50	1.64	-------	1.64	1.00	1.04	.83	19.89	17.50 18.00	775 1283
8.28	8.00	.71	8.99	8.50	9.91	-------	9.91	10.00	1.80	1.65	31.52	27.50	242
8.39	8.00	.71	9.10	8.50	4.01	-------	4.01	4.00	1.85	1.65	25.82	21.50 23.00	776 1253
7.92	8.00	.40	8.32	8.50	4.13	-------	4.13	4.00	1.73	1.65	24.87	24.00 23.00	365 1625
8.44	8.00	1.17	9.61	8.50	3.19	-------	3.19	3.00	2.56	2.47	28.46	28.00	295
7.51	7.00	.89	8.40	7.50	2.33	-------	2.33	1.00	.44	.42	16.94	20.00 15.00	296 1620
8.07	8.00	1.52	9.59	9.00	4.15	-------	4.15	4.00	*1.36	1.65	23.78	25.00	1180
8.79	8.00	.92	9.71	9.00	4.25	-------	4.25	4.00	.94	.82	22.47	------ 20.30 20.00	1093 685 1276
7.56	7.00	1.81	9.37	8.00	7.62	-------	7.62	7.00	*2.81	3.29	33.49	33.50 32.00	480 1490
10.68	10.00	.92	11.60	11.00	8.03	-------	8.03	8.00	.78	.82	27.61	25.50 24.00	589 778
8.83	8.00	.64	9.47	9.00	10.08	-------	10.08	10.00	1.62	1.65	31.23	28.00 30.00 31.00	777 479 1179
8.16	8.00	.58	*8.74	9.00	9.62	-------	*9.62	10.00	1.61	1.65	30.09	30.00	1635
9.20	9.00	.23	*9.43	10.00	5.53	-------	5.53	5.00	*1.45	1.65	26.18	26.00	1413
8.64	8.00	.51	9.15	9.00	4.68	-------	4.68	4.00	.76	.82	21.68	20.00 19.50	1282 1700
9.56	9.00	.89	10.45	10 00	3.26	-------	3.26	3.00	.78	.82	21.54	28.00 ------ 19.00	73 52 210

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
232	†Patapsco B. B. & P. Brand,	E. C. Thomas Gettysburg,	10.09
53		W. E. Harley, Thompsontown,	
491		Walter & Frederick, Montandon,	7.95
410	†Patapsco Corn and Tomato Fertilizer,	Russell Bros., Washington,	11.38
1816		Jacob Fritz, New Bloomfield,	
489	†Patapsco Early Trucker for Quick Growth.	Walter & Frederick, Montandon,	7.95
1279		H. P. Kocher, Wrightsville,	
1063	Patapsco Fish Guano,	G. W. Robison, Allenwood,	12.46
1885	Patapsco General Crop Producer,	Lewis Green, Little Gap,	9.61
74	†Patapsco Grain and Grass Producer,	G. A. Harley, Warrendale,	13.45
469		Fred. Allis, Rome,	
205	†Patapsco Potato Manure,	Jos. Berkholder, Hummelstown,	8.91
1884		Lewis Green, Little Gap,	
492	Patapsco Premium Superphosphate,	Walter & Frederick, Montandon,	11.26
1280	Patapsco Tobacco and Potato Fertilizer,	H. P. Kocher, Wrightsville,	10.09
	PENNSYLVANIA FERTILIZER CO., THE, BUFFALO, N. Y.		
1597	†Big Bonanza,	Reynoldsville, Reynoldsville,	9.99
417		J. M. Raab Bro., Midway,	
1907		H. A. Snyder, Strawberry Ridge,	
	J. D. PERKINS, COATESVILLE, PA.		
824	Perkins' Monarch Phosphate,	Edward Tingley, New London,	12.38
	VALENTINE PETROSKEY & SON, LATROBE, PA.		
880	Petroskey's Complete Fertilizer,	P. H. Saxman, Latrobe,	2.72
	PIEDMONT MT. AIRY GUANO CO., BALTIMORE, MD.		
1807	†Insular Guano or All Crops,	A. H. Ulsch, Millerstown,	6.54
1918		M. Gillis, Hughesvile,	
1033	†Piedmont Pennsylvania Grain Grower,	Jno. G. Simpson, Huntingdon,	7.34
874		Eli Sell Co., Greensburg,	
1739		James Maust, Elk Lick,	
1615	Piedmont Perfection Guano,	John McLean, Liberty,	7.21
1614	†Piedmont Pennsylvania Potato Producer,	J. McLean, Liberty,	6.21
1035		J. G. Simpson, Huntingdon,	
1686		J. G. Dubbs, Bellefonte,	
	PITTSBURGH PROVISION AND PACKING CO., PITTSBURG, PA.		
1859	†Corn and Potato Fertilizer,	W. J. Gilson, Titusville,	6.46
265		Weddle & Sutton, West Newton,	
1936		B. Way & Co., Freeport,	
1937	Special Potato Fertilizer,	B. Way & Co., Freeport,	7.83
	POLLOCK FERTILIZER CO., BALTIMORE, MD., BY A. A. C. C. OF NEW YORK.		
1044	Ammoniated Superphosphate,	J. H. Scott, Petersburg,	11.87
623	†Crop Invigorator,	W. A. Walker, Shirleysburg,	11.66
1046		J. H. Scott, Petersburg,	
601	†Special Potato and Tobacco Fertilizer,	I. E. Imler, Alum Bank,	11.27
323		Harvey Spencer, Cochranville,	
1100		B. J. Crissman, Curwensville,	
1283	†Superior Corn and Tomato Fertilizer,	Samuel A. Barshinger, Red Lion,	6.99
1703		Geo. W. Knisely, Clayburg,	

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
8.26	8.00	.92	9.18	9.00	2.24	-------	2.24	2.00	.47	.41	15.04	17.00 ------ 16.00	232 53 491
9.44	9.00	1.33	10.77	10.00	2.42	-------	2.42	2.00	1.21	1.23	22.36	28.00 23.00	410 1816
8.10	7.00	1.84	9.94	8.00	5.44	-------	5.44	5.00	4.08	4.11	37.81	34.00 34.00	489 1279
6.94	6.00	.24	7.18	7.00	2.02	-------	2.02	2.00	1.58	1.65	20.95	23.00	1063
6.92	7.00	1.65	8.57	8.00	1.29	-------	1.29	1.00	.73	.82	16.99	19.00	1885
8.51	8.00	1.19	9.70	9.00	3.89	-------	3.89	4.00	.96	.82	21.97	28.00 21.00	74 469
6.23	5.00	.91	7.14	6.00	8.96	-------	*8.96	10.00	1.51	1.65	27.18	26.00 27.00	205 1884
8.03	8.00	1.66	9.69	9.00	10.11	-------	10.11	10.00	1.53	1.65	30.78	27.00	492
7.92	8.00	.91	8.83	9.00	4.03	-------	4.03	4.00	1.69	1.65	24.82	24.00	1280
8.52	8.00	1.64	10.16	9.00	4.59	-------	4.59	4.00	1.03	.80	23.35	25.00 23.00 18.00	1597 417 1907
*9.78	10.00	.23	*10.01	11.00	4.91	-------	4.91	5.00	*.93	1.23	30.34	27.00	824
3.83	-------	9.00	12.83	10.00	6.91	-------	6.91	5.50	*4.00	4.94	37.93	30.00	880
7.21	7.00	.31	7.52	-------	2.39	-------	2.39	2.00	.56	.41	16.84	16.00 18.00	1807 1918
8.19	7.00	.26	8.45	-------	5.04	-------	5.04	5.00	1.05	.82	22.82	21.00 25.00 22.00	1033 874 1739
8.14	8.00	.54	8.68	-------	5.43	-------	7.43	5.00	1.53	1.65	25.60	27.00	1615
7.23	6.00	.36	7.59	-------	8.95	-------	*8.95	10.00	1.52	1.65	27.93	29.00 28.00 33.00	1614 1035 1686
9.01	9.00	1.21	*10.22	11.00	2.91	-------	2.91	3.00	1.63	1.43	24.64	27.00 24.00 26.00	1859 265 1936
9.98	9.00	1.28	11.26	10.00	6.90	-------	6.90	7.00	*1.22	1.64	27.72	30.00	1937
8.79	8.00	1.03	9.82	9.00	1.96	-------	1.96	2.00	1.51	1.65	22.69	-------	1044
8.54	8.00	.80	9.34	9.00	4.24	-------	4.24	4.00	.80	.82	21.49	------ ------	623 1046
7.91	8.00	1.49	9.40	9.00	3.96	-------	3.96	4.00	1.57	1.65	24.28	25.25 24.00 26.00	601 323 1100
8.69	8.00	1.25	9.94	9.00	2.16	-------	2.16	2.00	.76	.82	19.50	20.00 20.00	1283 1703

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	RAMSBURG FERTILIZER CO., FREDERICK, MD.		
1247 1669	†Old Virginia Compound,	Humbert & Krug, Littlestown,	10.91 11.01
1246	Ammoniated Phosphate,	Franklin Miller & Son, Greencastle, Humbert & Krug, Littlestown,	
	RAISIN MONUMENTAL CO., BALTIMORE, MD.		
1318	Raisin's Empire Guano,	H. B. Low & Son, Orangeville,	9.43
1649	Raisin's General Tobacco Grower,	L. A. Geiger, Joanna,	8.70
831 249 1056	†Raisin's Genessee Valley Root Manure,	W. H. Walker & Co., Kennett Sq., Aspers Milling & Products Co., Aspers. Adam Krug, Allenwood,	9.17
250 58 1154	†Raisin's National Crop Compound,	Aspers Milling & Produce Co., Aspers. W. W. Book, Port Royal, H. D. Miller, Mifflinville,	13.06
1242 57 1833	†Raisin's United Grain Grower,	J. R. Weaver & Bro., New Oxford, W. W. Book, Port Royal, Crawford Bros. Co., North East,	9.26
1057 319 1080	†Raisin's Royal Fish, Bone and Potash,	Adam Krug, Allenwood, E. H. Keen & Co., Parkesburg, Isaac Shirley, McClure,	11.59
690 625 893	†Raisin's Vegetable Special,	Sam'l B. Miller, Mifflinburg, R. F. D. O. H. Uhler, Easton, R. F. D. No. 1 S. P. Snyder, Northumberland, R. D. 1.	8.85
1257 56 1689	†Raisin's Wheat, Corn and Oats Mixture,	J. D. Markle, Hanover, W. W. Book, Port Royal, Jno. G. Dubbs, Bellefonte,	9.41
1535 1906	†Raisin's I. X. L. Fertilizer,	C. B. McCormick, State College, James W. Hause, Jerseytown,	12.29
1317 608 1848	†Raisin's X. X. X. Fertilizer,	H. B. Low & Son, Orangeville, A. C. Richards & Son, Schellsburg, R. D. W. A. Porter, Cambridge Springs,	10.89
1081 832 1908	†William Penn Crop Grower,	Isaac Shirey, McClure, W. H. Walker & Co., Kennett Sq., H. A. Snyder, Strawberry Ridge,	7.76
	READING BONE FERTILIZER CO., READING, PA.		
599 570 1264	†Farmer's Tankage and Potash for Corn, Grain and Grass.	Wm. Hunt, Great Bend, Krause & Freehley, Marwood, K. A. Smyser (for own use), York,	7.16
291 899	†Farmer's Union Fertilizer,	Reading Bone Fert. Co., Reading, C. L. Pope, Catawissa, R. D. 5,	7.09
449 255 1461	†Gilt Edge Potato and Tobacco Grower,	Hadisty & Son, Tamaqua, Grover C. Myers, Idavile, H. S. Hoover, Campbelltown,	5.98
1661	Never Fail Crop Grower,	D. H. Latshaw, Bechtelsville,	7.62
585 97 820	†Sterling Potato Grower,	P. L. Tonhey, Warrenham, Sam'l Savidge, Valley View, H. B. Rosenberger, Doylestown,	6.66
2035	Tobacco and Truck Special,	Ed. Kreckel, Lancaster,	7.90

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
10.10	8.00	2.08	12.18	-------	4.16	-------	4.16	4.00	1.11	1.00	24.97	20.00 20.00	1247 1669
10.31	10.00	3.17	13.48	-------	2.02	-------	2.02	2.00	.98	.82	23.05	18.50	1246
9.18	8.00	2.27	11.45	9.00	1.95	-------	1.95	2.00	1.73	1.65	24.84	20.50	1318
8.04	8.00	3.63	11.67	9.00	3.01	-------	3.01	3.00	1.63	1.65	24.90	20.00	1649
*7.46	8.00	2.08	9.54	9.00	10.35	-------	10.35	10.00	.89	.82	27.85	26.00 25.00 24.00	831 249 1056
8.09	8.00	2.75	10.84	9.00	3.94	-------	3.94	4.00	.87	.82	21.90	20.75 21.00 20.00	250 58 1154
8.35	8.00	2.23	10.58	9.00	2.66	2.15	2.81	2.00	.87	.82	21.25	17.25 20.50 20.00	1242 57 1833
7.91	8.00	3.44	11.35	9.00	3.37	-------	3.37	3.00	1.53	1.65	24.61	22.00 23.00 22.00	1057 319 1080
7.99	8.00	1.44	9.43	9.00	4.30	3.49	*7.79	10.00	*1.26	1.65	27.76	------ 24.65 28.50	690 625 893
8.23	8.00	1.84	10.07	9.00	1.97	-------	1.97	2.00	.56	.41	15.48	16.50 17.00 19.50	1257 53 1689
9.94	9.00	1.90	11.84	10.00	3.26	-------	3.26	3.00	1.08	.82	23.79	20.00 18.00	1535 1906
8.60	8.00	1.98	10.58	9.00	5.30	-------	5.30	5.00	1.51	1.65	26.38	22.50 23.00 24.50	1317 608 1848
8.40	8.00	1.80	10.20	9.00	1.44	-------	1.44	1.00	.95	.82	19.64	17.50 20.00 17.00	1031 832 1908
8.27	8.00	1.16	9.43	9.00	4.50	-------	4.50	4.00	.92	.82	22.12	22.00 25.00 16.75	599 570 1264
8.08	8.00	1.44	9.52	9.00	8.18	-------	8.18	8.00	1.51	1.64	28.57	24.00 26.50	291 899
7.32	7.00	1.35	8.67	8.00	10.22	-------	10.22	10.00	1.51	1.64	29.74	33.00 30.00 28.00	449 255 1461
7.80	8.00	1.34	9.14	9.00	1.77	-------	1.77	1.00	.76	.82	18.21	-------	1661
7.51	8.00	1.70	9.21	9.00	10.89	-------	10.89	10.00	1.05	.82	28.78	28.00 ------ 28.50	585 97 820
7.16	6.00	1.38	8.54	7.00	*5.48	-------	6.24	6.00	*2.19	2.46	28.02	-------	2035

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	ROBERT A. REICHARD, ALLENTOWN, PA.		
155	†Golden Harvest Phosphate,	William Mitman, Easton, R. F. D. 3.	9.19
537		Westn H. Kern, Emerald,	
156	†Lehigh Potato Manure,	William Mitman, Easton, R. F. D. 3	10.23
107		James Lichtenwalter, Allentown, R. D. 4.	
165		Mr. Gerlouch, Bethlehem,	
166	†Peerless Phosphate,	Mr. Gerlouch, Bethlehem,	8.56
154		William Mitman, Easton, R. F. D. No. 3.	
538		Weston H. Kern, Emerald,	
106	†Trucker's Favorite,	James Lichtenwalter, Allentown, R. D. 4.	6.65
164		Mr. Gerlouch, Bethlehem,	
	F. S. ROYSTER GUANO CO., BALTIMORE, MD.		
303	†Royster's Big Yield Potato Producer,	H. B. Shortlidge, Kelton,	6.62
279		King Bros., Uniontown,	
547		Orville Wootring, Jordan,	
789	†Royster's Champion Crop Compound,	George Watson, Embreevile,	9.95
435		W. M. Gehman, Macungie,	
1124		E. C. Rogers, Brooklyn,	
145	†Royster's Corn and Hop Special Fertilizer	A. W. Sandt, Martin's Creek,	7.36
1402		Thos. Crayton, Leroy,	
146	†Royster's Challenge Complete Compound,	A. W. Sandt, Martin's Creek,	7.69
1654		Chas. Geiger (pur. from factory for own use), Scarlett Mills.	
1663	†Royster's Excellenza Tobacco Guano,	Chas Geiger (pur. from factory for own use), Scarlett Mills.	8.65
1774		S. A. Phillipy, Schaefferstown, R.,	
63	†Royster's Farmer's Delight Fertilizer,	B. F. Gayman, Thompsontown,	8.57
258		John W. King, York Springs, R. D. 6.	
546	†Royster's Fish, Flesh and Fowl,	Orville Wootring, Jordan,	8.53
305		H. B. Shortlidge, Kelton,	
1333		E. S. Lemon, Forks, R. D.,	
720	†Royster's Gold Seal Potato and Tobacco Special.	Hopbottom Grange, Hopbottom,	8.58
441		Amandus Wotring, Schnecksville,	
788		George Watson, Embreesville,	
1334	Royster's Good Cheer Brand,	E. L. Lemon, Forks, R. D.,	6.62
88	†Royster's Harvest King Fertilizer,	Jacob Barnhart, Harmony,	9.23
1547		R. D. Forman, Centre Hall,	
630	†Royster's Lehigh Potato Grower,	Erwin Fisher, Nazareth,	5.38
304		H. B. Shortlidge, Kelton,	
1340		J. H. Long, Orwigsburg,	
710	†Royster's Practical Truck Guano,	The Harford Grange, Harford,	7.69
1953		H. L. Stultz, Hollidaysburg,	
1165	†Royster's Prolific Potato Producer,	C. E. Houck, Beaver Valey,	7.37
90		Jacob Barnhart, Harmony,	
1604		Preston Bros., Canton,	
278	†Royster's Special Wheat, Corn and Grass Producer.	King Bros., Uniontown,	7.42
1708		Alonza Cwyle, Osterburg,	
1891	Royster's Universal Crop Grower,	Amandus Wotring, Snecksville,	9.06
436	†Royster's Wheat, Oats and Barley Fertilizer.	W. M. Gehman, Macungie,	8.19
89		Jacob Barnhart, Harmony,	
525		Jos. Baker, Ebensburg, R. D.,	

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
8.26	8.00	.69	*8.95	10.00	5.65	-------	5.65	5.00	*1.39	1.64	25.29	------ 24.00	155 537
7.72	8.00	1.01	*8.73	10.00	9.90	-------	9.90	10.00	1.62	1.64	30.19	------ ------ 32.00	156 107 165
7.87	8.00	1.28	*9.15	9.50	4.80	-------	4.80	4.00	.81	.82	21.57	22.00 ------ 20.50	163 154 538
7.09	6.00	.20	*7.29	7.50	8.84	-------	8.84	8.00	*2.93	3.28	33.99	------ 36.00	106 164
5.00	5.00	1.12	6.12	5.50	9.57	-------	*9.57	10.00	1.46	1.65	26.38	27.00 32.00 25.00	303 279 547
8.01	8.00	1.42	9.43	8.50	4.31	-------	4.31	4.00	1.68	1.65	25.38	24.00 25.00 24.00	789 435 1124
8.03	8.00	.84	8.87	8.50	2.70	-------	*2.70	3.00	*1.30	2.06	21.70	23.50 27.00	145 1402
10.77	8.00	2.19	12.96	8.50	6.51	-------	6.51	6.00	1.58	1.65	30.36	22.40 25.00	146 1654
7.82	8.00	2.16	9.98	8.50	7.05	-------	7.05	7.00	3.34	3.29	35.90	35.00 36.00	1663 1774
*7.79	8.00	.78	8.57	8.50	2.48	-------	2.48	2.00	.56	.41	18.21	------ 16.00	63 258
8.06	8.00	2.04	10.10	8.50	3.44	-------	3.44	3.00	1.71	1.65	24.86	22.00 24.00 23.00	546 305 1333
8.17	8.00	1.12	9.29	8.50	9.64	-------	*9.64	10.00	1.71	1.65	30.79	24.00 ------ 30.00	720 441 788
*6.86	8.00	.98	7.86	8.50	4.47	-------	4.47	2.00	.94	1.03	20.73	22.00	1334
*7.61	8.00	2.31	9.92	8.50	2.17	-------	2.17	2.00	1.58	1.65	22.75	26.00 21.90	88 1547
7.26	7.00	1.03	8.29	7.50	14.02	-------	*14.02	15.00	.96	.82	30.91	28.00 30.00 28.50	630 304 1346
7.96	8.00	1.13	9.09	8.50	5.81	-------	5.81	6.00	2.54	2.47	30.61	25.00 35.00	710 1953
6.17	6.00	1.03	7.20	6.50	5.01	-------	5.01	5.00	1.22	1.23	21.68	21.65 26.00 25.00	1165 90 1604
*7.85	9.00	1.49	9.34	9.50	3.33	-------	3.33	2.00	1.33	.82	22.70	24.00 19.00	278 1708
8.66	7.00	1.31	9.97	7.50	3.13	-------	3.13	1.00	1.00	.82	21.62	17.00	1891
*7.77	8.00	1.22	8.99	8.50	2.15	-------	2.15	2.00	1.01	.82	19.69	20.00 24.00 19.90	436 89 525

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	SCHAAL-SHELDON FERTILIZER CO., BUFFALO, N. Y.		
722	†Empire,	P. A. Drane, Sarver,	8.57
1543		Harry Shirk, Center Hall,	
1850	Farmer's Favorite,	Brooklyn Milling Co., Spartansburg,	9.16
1002	†Guano,	J. L. Fisher, Lancaster, R. No. 6,	9.91
576		P. A. Drane, Marwood,	
1851		Brooklyn Milling Co., Spartansburg,	
1003	Potato and Tobacco Fertilizer,	J. L. Fisher, Lancaster, R. No. 6,	5.17
1483	†Schaal's Corn and Potato,	J. L. Fisher, Lancaster, R. No. 6,	9.48
721		P. A. Drane, Sarver,	
1852		Brooklyn Milling Co., Spartansburg,	
48	Superior,	John Artley, Muncy,	10.28
1001	†Trucker's Manure,	J. L. Fisher, Lancaster, R. No. 6,	8.52
1544		Harry Shirk, Center Hall,	
	SCOTT FERTILIZER CO., THE, ELKTON, MD.		
1017	†Scott's Corn and Oats Grower,	Emory Reichenbach, St. Johns,	6.37
991		S. H. Beiler, Witmore,	
1379		Wm. C. Holbrook, Ercildown,	
965	†Scott's Potato Grower,	A. B. Groff, New Holand,	9.61
813		Samuel T. Erwin, Somerton,	
1467		Elias Brubaker, Richland,	
1380	†Scott's Potato and Truck Special,	Wm. C. Holbrook, Ercildown,	7.80
1469		Elias Brubaker, Richland,	
1470	Scott's Sure Growth Compound,	Elias Brubaker, Richland,	7.14
967	†Scott's Sure Growth Superphosphate,	A. B. Groff, New Holland,	9.24
1018		Emery Reichenback, St. Johns,	
	A. B. SCHUMACHER, HAZLETON, PA.		
1007	General Brand Fertilizer,	Emil Freiderick, Conyngham,	7.38
	M. L. SHOEMAKER & CO., LTD., PHILADELPHIA, PA.		
212	†Shoemaker's Special 10% Potato Fertilizer No. 2.	J. B. Shaffer, Swatara,	8.09
192		N. W. Stroup, Elizabethville,	
1894		S. B. Kuntz, Trichlers,	
543	†Shoemaker's Swift Sure Guano for Tomatoes, Truck and Corn.	Nathan Handwerk, Saegersville,	7.86
1652		L. A. Geiger, Joanna,	
1625	†Shoemaker's New Jersey Special for Oats,	Frank Hain, Cressona,	8.23
1926		Furst Bros., Cedar Springs,	
1652	†Shoemaker's Swift Sure Superphosphate for Potaotes.	Chas. Geiger farm, Scarlett Mills,	7.84
333		W. E. Irvin, Somerton,	
1893		S. B. Kuntz, Trichler's	
10	†Shoemaker's Special 10% Potato Fertilizer No. 1.	A. F. Spittler, Pine Grove, R. D.,	8.44
334		W. E. Erwin, Somerton,	
	CHAS. A. SICKLER & Bro., WILKES-BARRE, PA.		
719	Empire Phosphate,	M. McVicar, Hopbottom,	6.46
718	Grave's Potato and Tobacco Manure,	M. McVicar, Hopbottom,	8.58
	SMITH AGRICULTURAL CHEMICAL CO., COLUMBBUS, O.		
1457	Ohio Farmer's Excelsior Phosphate,	H. S. Amiden, Edinboro,	6.19
	STANDARD GUANO CO., BALTIMORE, MD.		
1740	Best Truck Crop Grower,	James Maust, Elk Lick,	9.09
942	Standard Farmer's Favorite,	S. M. Book & Bro., Quarryville,	7.26
944	Great Grain Grower,	S. M. Book & Bro., Quarryville,	7.56

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen. in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
7.74	7.00	1.63	9.37	8.00	2.84	-------	2.84	1.00	1.11	.82	21.00	22.00 ------	722 1543
*7.55	8.00	2.65	10.20	9.00	2.20	-------	2.20	2.00	.84	.82	19.50	20.50	1850
8.60	8.00	1.43	10.03	9.00	4.05	-------	4.05	4.00	.94	.82	22.33	18.00 25.00 22.00	1006 576 1851
8.19	8.00	1.46	9.65	9.00	9.81	-------	9.81	10.00	*1.36	1.65	29.61	26.50	1003
8.45	8.00	1.81	10.26	9.00	4.35	-------	4.35	4.00	1.54	1.65	25.39	21.25 27.00 22.50	1483 721 1852
7.95	7.00	.91	8.86	8.00	8.86	-------	8.86	9.00	*.70	.82	25.16	25.00	48
9.14	8.00	1.44	10.58	9.00	5.95	-------	5.95	6.00	*2.26	2.47	37.93	28.00 30.50	1001 1544
7.84	8.00	1.87	9.71	-------	3.32	-------	3.32	2.00	.74	.41	21.08	20.00 ------ 17.50	1017 991 1379
7.99	8.00	3.57	11.56	-------	10.10	-------	10.10	10.00	1.80	1.65	32.78	28.00 30.00 28.00	965 818 1467
8.61	8.00	1.72	10.33	-------	5.69	-------	5.69	5.00	1.63	1.65	27.33	25.00 25.00	1380 1469
8.15	7.00	2.11	10.26	-------	7.78	-------	7.78	7.00	3.22	3.30	36.27	33.00	1470
9.28	8.00	.56	9.84	-------	3.42	-------	3.42	3.00	1.81	1.65	25.83	24.00 25.00	967 1018
*7.24	‡8.00	3.76	11.00	-------	4.52	-------	*4.52	8.00	2.24	1.65	28.45	25.00	1007
10.45	8.00	1.36	11.81	10.00	9.68	-------	*9.68	10.00	1.73	1.65	33.58	------ ------ 28.50	212 192 1894
9.63	8.00	2.52	12.15	10.00	5.35	-------	5.35	5.00	1.72	1.65	28.65	24.00 25.00	543 1652
10.52	8.00	2.42	13.94	11.00	2.53	-------	2.53	2.00	1.58	.82	26.70	18.00 20.00	1025 1926
9.78	8.00	3.23	13.01	11.00	7.30	-------	7.30	7.00	2.74	2.88	35.90	33.00 32.00 32.00	1653 333 1893
8.36	6.00	2.13	10.49	8.00	8.06	-------	*8.06	10.00	3.52	3.30	38.12	34.00 34.00	10 334
*6.44	8.00	2.52	8.96	9.00	4.21	-------	4.21	2.00	1.65	1.65	23.98	21.00	719
6.46	6.00	1.48	7.94	-------	5.87	-------	5.87	5.00	1.38	1.23	24.04	27.00	702
8.19	8.00	.83	9.02	-------	6.42	-------	*6.42	7.00	.76	.82	23.12	27.00	1457
8.14	8.00	.55	8.69	8.50	7.82	-------	7.82	7.00	.99	.82	25.50	25.00	1740
*7.52	8.00	2.20	9.72	8.50	3.08	-------	3.08	3.00	.74	.41	19.70	17.00	942
*7.40	8.00	1.60	9.00	8.50	5.44	-------	5.44	4.00	1.29	.82	20.20	20.00	944

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*Constituent falls below guaranty. ‡Guaranteed soluble only.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	STRAYER BROS. & CO., YORK, PA.		
1268	Strayer's Special Wheat and Corn,	Strayer Bro. & Co.. York,	11.13
	JOHN T. SWACK, DUBOIS, PA.		
121	Swack's Potato and Truck Fertilizer,	E. J. Flynn, Grampian,	9.39
	SWIFT & CO., BALTIMORE, MD.		
1251	Swift's Ammoniated Guano,	A. P. Lippy, Littlestown,	5.77
392	Swift's Early Potato & Vegetable Grower,	Lan. Co. Farmers' Assn., Mechanicsville,.	8.61
1278	Swift's Early Truck,	H. P. Kocher, Wrightsville,	8.18
972	Swift's Golden Grain Grower,	H. W. Swigart, Gap,	10.38
1831	Swift's Pure Ammoniated Bone & Potash,	Jay Spofford, North East,	4.42
1826	Swift's Pure Diamond "B" Fertilizer,	Fred Ruhling, McKean,	9.38
1378	†Swift's Pure Diamond "C" Fertilizer,	B. W. Jones, Doe Run,	7.92
1322		H. B. Low & Son, Orangeville,	
1436		P. G. Young's Sons, New Galilee,	
393	Swift's Pure Diamond "D" Fertilizer,	Lan. Co. Farmers' Assn., Manheim,	7.70
1440	Swift's Pure Diamond "E" Fertilizer,	R. G. Young's Sons, New Galilee,	8.73
1439	†Swift's Pure Grain Fertilizer,	R. G. Young's Sons, New Galillee,	7.82
1683		McCalmont & Co., Bellefonte,	
1780	†Swift's Pure Onion, Potato and Tobacco Fertilizer.	A. G. Houtz, Myerstown, R. No. 1,	10.23
1832		Jay Spofford, North East,	
550	†Swift's Pure Potato, Celery and Onion Grower.	Amandus Wootring, Schnecksville,	4.73
834		W. H. Walker & Co., Kennett Sq.,	
1319	†Swift's Pure Superphosphate,	H. B. Low & Son, Orangeville,	7.47
555		W. J. Kennachy & Co., Mars,	
1437		R. G. Young's Sons, New Galilee,	
391	†Swift's Pure Truck Grower,	Lan. Co. Farmers' Assn., Manheim, R. D.	10.63
162		J. R. Hummel, Bethlehem,	
548		Amandus Wooting, Schnecksville,	
552	†Swift's Pure Red Steer Fertilizer,	Amandus Wooting, Schnecksville,	8.49
798		A. L. Stout, Churchville,	
974	†Swift's Special Potato Fertilizer,	H. W. Sweiger, Gap,	8.19
1679		McCalmont & Co., Bellefonte,	
	D. A. THOMAS & CO., HAGERSTOWN, MD.		
780	†Empire,	E. W. Rupp, Shiremanstown,	9.75
1643		J. A. Witherspoon, Mercersburg,	
1644	Golden Sheaf,	J. A. Witherspoon, Mercersburg,	9.58
762	†Keystone Compound,	Nickles & Stewart, Shippensburg,	8.09
1223		Joseph Gochenour, Bermudian,	
781	Orchard Special,	E. W. Rupp, Shiremanstown.	8.84
761	†Planter's Mixture,	Nickles & Stewart, Shippensburg,	7.99
779		E. W. Rupp, Shiremanstown,	
	I. P. THOMAS & SONS CO., PHILADELPHIA, PA.		
167	†Normal Phosphate,	Titus C. Bachman, Hellertown,	9.83
563		Morow & Buxton, Valencia,	
853	†Potato Fertilizer,	Wm. J. Moyer, Greenville,	8.77
686		J. F. Grubb, Mifflinburg,	
1335		C. R. Henrie & Son, Millville,	
1606	Special Mixture,	D. Irvin & Son, Odersburg,	8.86
357	†Special Potato Manure,	Elmer Eaby, Lititz,	7.14
168		Titus C. Bachman, Hellerton,	
476		F. L. Van Orman, LeRaysville,	
356	Thomas' Scientific Tobaco Grower,	Elmer Eaby, Lititz,	8.12
985	†Thomas' Wheat and Corn Fertilizer,	Elmer Leaman, Ronks,	9.15
850		W. J. Moyer, Greenville,	
1019		John T. Davis, St. Johns,	

†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen. in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
8.36	8.00	.78	9.14	8.50	2.00	-------	2.00	2.00	.92	.82	19.45	17.50	1268
7.40	‡7.00	4.31	11.71	-------	9.56	-------	*9.56	10.00	2.38	2.47	35.22	29.25	121
*7.35	8.00	.49	*7.84	9.00	3.15	-------	3.15	3.00	8.48	.41	17.24	20.00	1251
6.67	6.00	.32	6.99	7.00	10.17	-------	10.17	10.00	*3.07	3.29	35.64	30.00	392
7.28	7.00	.50	*7.78	8.00	3.34	-------	*3.34	5.00	*3.79	4.12	32.84	31.50	1278
7.88	8.00	.55	*8.43	9.00	5.01	-------	5.01	5.00	1.65	1.65	25.35	21.00	972
9.39	-------	7.84	17.23	16.00	3.07	-------	3.07	3.00	4.85	4.75	42.98	34.30	1831
8.46	8.00	.99	9.45	9.00	2.84	-------	*2.84	5.00	*2.18	2.50	26.43	31.00	1826
8.29	8.00	.98	9.27	9.00	4.40	-------	4.40	4.00	1.54	1.65	24.91	24.00 21.75 27.00	1378 1322 1436
5.86	6.00	.34	*6.20	7.00	9.45	-------	*9.45	10.00	*2.22	2.47	30.20	27.00	393
8.88	8.00	1.86	10.74	9.00	6.29	-------	*6.29	7.00	*2.87	3.29	34.03	36.00	1440
9.18	8.00	.70	9.88	9.00	2.22	-------	2.22	2.00	1.05	.82	21.15	23.00 20.00	1439 1683
8.56	8.00	.62	9.18	9.00	6.98	-------	6.98	7.00	1.49	1.65	27.44	26.00 27.40	1780 1832
4.96	5.00	.27	*5.23	6.00	11.15	-------	11.15	10.00	*.56	.82	23.50	23.00 27.50	550 834
9.15	8.00	.60	9.75	9.00	1.98	-------	1.98	2.00	1.65	1.65	23.59	20.50 24.00 25.00	1319 555 1437
8.47	8.00	.66	9.13	9.00	3.86	-------	3.86	4.00	.93	.82	21.64	16.75 20.50 19.00	391 162 548
8.02	8.00	1.47	9.49	9.00	2.38	-------	2.38	2.00	1.61	1.65	23.05	21.00 23.00	552 798
8.09	8.00	.63	*8.72	9.00	10.18	-------	10.18	10.00	1.58	1.65	30.66	------ 32.00	974 1679
7.87	8.00	.96	8.83	9.00	10.08	-------	10.08	10.00	1.58	1.65	30.52	27.00 30.00	780 1643
8.13	8.00	.73	8.86	9.00	1.17	-------	1.17	1.00	.87	.82	18.08	16.00	1644
*7.74	8.00	1.44	9.18	9.00	4.11	-------	4.11	4.00	.86	.82	21.07	20.00 19.00	762 1223
*9.65	10.00	.76	*10.41	11.00	14.22	-------	*14.22	15.00	.81	.82	32.73	31.00	781
7.94	8.00	1.39	9.33	9.00	6.05	-------	6.05	6.00	.97	.82	23.68	22.50 20.00	761 779
9.01	8.50	.59	9.60	9.50	2.50	-------	2.50	1.50	*.89	1.00	20.53	------ 23.00	167 563
9.68	9.00	1.17	10.85	10.00	6:10	-------	6.10	6.00	1.77	1.65	28.95	28.00 24.50 27.00	853 686 1335
*9.73	10.00	1.26	10.99	11.00	8.30	-------	*8.30	10.00	.47	-------	25.47	21.50	1606
*6.71	7.00	1.39	8.10	8.00	9.62	-------	*9.62	10.00	1.79	1.65	29.91	27.50 ------ 25.50	357 168 476
8.76	8.00	1.52	10.28	9.00	2.40	3.46	5.86	6.00	2.59	2.50	32.74	29.50	356
9.17	9.00	.91	10.08	10.00	3.36	-------	3.36	3.00	.98	.83	22.20	20.00 22.00 22.00	985 850 1019

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*Constituent falls below guaranty. ‡Guaranteed soluble only.

Sample number	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
198	†Victor Potash Manure,	H. L. Hoffman, Enola,	9.47
103		O. H. Cressman, Allentown, R. D. 4,	
475		F. L. Van Orman, LeRaysville,	
	JAMES THOMAS, WILLIAMSPORT, PA.		
1533	†Thomas' Klondike Brand Phosphate,	John Watt, Bellville,	7.83
1407		T. S. Green, Canton,	
1596		Keystone Hdw. Co., Reynoldsville,	
128	†Thomas' Potato and Truck Manure,	Smith Bros. Co., Ridgway,	8.37
1531		John Watt, Belleville,	
1532	†Thomas' Standard Brand Phosphate,	John Watt, Belleville,	7.94
1406		T. S. Green, Canton,	
1595		Keystone Hdw. Co., Reynoldsville,	
	TRENTON BONE FERTILIZER CO., TRENTON, N. J.		
808	Trenton Corn Mixture,	L. A. Howells, Morrisville,	6.73
805	Trenton High Grade Potato Fertilizer,	L. A. Howells, Morrisville,	9.07
806	Trenton Keystone Potato Manure,	L. A. Howells, Morrisville,	8.44
807	Trenton Special Corn Manure,	L. A. Howells, Morrisville,	7.30
	JACOB J. TRINLEY & SONS, LINFIELD, PENNA.		
1385	Ravene Phosphate for All Crops,	Isaac A. Hartman, Anselma,	7.62
	F. W. TUNNELL & COMPANY, INC., PHILADELPHIA, PA.		
332	†Ammoniated Phosphate and Potash,	Richard B. Jackson, Cochranville,	5.19
437		W. M. Gehman, Macungie,	
817	Empire Potato Manure,	John B. Satterthwaite, Woodbourne	11.99
829	†No. 1 Special High Grade Potato Mixture,	H. A. Mendenhall, Toughkenamon,	9.47
433		W. M. Gehman, Macungie,	
1367		Malvern Farm Supply Co., Malvern,	
434	†Potato and Grain Manure,	W. M. Gehman, Macungie,	12.15
830		H. A. Mendenhall, Toughkenamon,	
795	†Raw and Acidulated Animal Compound,	John C. Rhodes, Newton Square,	9.02
992		H. C. Breckbill, Strasburg,	
794	Royal Fish Guano,	John C. Rhodes, Newton Square,	10.97
1617	Special High Grade Potato Manure,	Carl Nicholas, Sebring,	12.03
331	†Sweet and White Potato Manure,	Richard B. Jackson, Cochranville,	12.18
1024		Frank Rubert, Cressona,	
	TUSCARORA FERTILIZER CO., BALTIMORE, MD.		
283	†Fruit and Potato,	Frederick & Inks, Fairchance,	9.18
892		Frank Geist (not an agent), Northumberland, R. D.	
284	York State Special,	Frederick & Inks, Fairchance,	7.81
	J. E. TYGERT CO., THE, PHILADELPHIA, PA. BY A. A. C. CO., N. Y.		
1158	Early Truck Guano,	Geo. S. Miller, Mifflinville,	10.76
1160	Gold Edge Potato Guano,	Geo. S. Miller, Mifflinville,	12.72
161	†Golden Harvesst Phosphate,	Lovine Lerch, Bethlehem, R. F. D. 1	11.26
1156		Geo. S. Miller, Mifflinville,	
1159	Potato Fertilizer,	Geo. S. Miller, Mifflinville,	10.84
797	Standard Fertilizer,	Edward Shallcross, Bustleton,	12.48
1157	Ten Per Cent. Grain Grower,	Geo. S. Miller, Mifflinville,	10.63
796	Potato Special,	Edward Shallcross, Bustleton,	10.29

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†Composite sample.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen. in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
7.85	8.00	1.28	9.13	9.00	5.25	-------	5.25	5.00	1.10	.83	23.40	------- 20.00 19.50	198 109 475
9.62	9.00	.73	10.35	10.00	3.48	-------	3.48	3.00	.90	.82	22.23	22.00 22.00 24.00	1533 1407 1596
*7.52	8.00	1.39	8.92	9.00	5.08	-------	5.08	5.00	1.60	1.65	25.23	33.00 30.00	128 1531
*7.70	8.00	.78	*8.48	9.00	1.46	-------	1.46	1.00	.87	.82	18.00	20.00 20.00 22.00	1532 1406 1595
8.79	7.00	.54	9.33	-------	3.23	-------	3.23	3.00	1,71	1.65	24.70	28.00	808
6.15	6.00	.98	7.13	-------	9.87	-------	9.87	10.00	*2.52	3.29	32.66	36.00	805
7.96	8.00	.71	8.67	-------	10.15	-------	10.15	10.00	1.96	1.65	32.08	31.00	806
8.37	8.00	.59	8.96	-------	3.53	-------	3.53	3.00	2.02	1.65	25.95	26.00	8.07
*8.69	9.00	.87	*9.60	10.00	3.61	-------	3.61	3.00	1.06	1.23	22.20	22.00	1385
7.50	7.00	1.02	8.52	8.00	1.95	-------	1.95	2.00	.51	.21	14.43	19.00 19.00	332 437
5.89	6.00	1.01	6.90	7.00	12.07	------	12.07	10.00	*2.57	3.29	34.77	32.00	817
8.11	8.00	.60	8.71	9.00	10.89	-------	10.89	10.00	2.54	2.47	35.71	32.50 31.50 33.00	829 433 1367
7.60	7.00	.66	8.26	8.00	6.77	-------	6.77	4.00	1.65	1.65	26.88	25.00 26.50	434 830
10.84	10.00	6.03	*16.87	20.00	2.03	-------	2.03	-------	*1.05	1.65	21.27	27.00 27.00	795 992
7.23	7.00	.65	7.88	8.00	5.06	-------	5.06	3.00	2.33	1.85	27.97	28.50	794
6.27	6.00	1.06	7.33	7.00	10.29	-------	10.29	10.00	2.54	2.47	33.48	31.60	1617
7.45	7.00	.98	8.43	8.00	8.01	-------	8.01	8.00	*1.34	1.65	26.77	30.00 30.00	331 1024
8.06	8.00	.85	8.91	8.50	10.02	-------	10.02	10.00	1.68	1.65	30.97	33.00 26.00	283 892
*7.71	8.00	1.21	8.92	8.50	4.25	-------	4.25	4.00	.90	.82	21.27	24.00	284
6.43	6.00	1.77	7.60	7.00	2.96	-------	2.96	2.00	3.13	3.29	28.90	28.00	1158
7.00	7.00	1.07	8.07	8.00	5.06	-------	5.06	5.00	1.56	1.65	24.26	24.50	1160
*6.94	8.00	2.72	9.66	9.00	2.85	-------	2.85	2.00	.64	.41	18.66	16.00 18.50	161 1156
6.47	6.00	1.75	8.22	7.00	6.22	-------	6.22	5.00	.88	.82	22.24	21.50	1159
8.02	8.00	1.86	9.88	9.00	2.17	-------	2.17	2.00	1.69	1.65	23.49	27.00	797
7.62	7.00	.98	8.60	8.00	9.60	-------	*9.60	10.00	1.04	1.23	27.21	28.00	1157
7.29	7.00	.94	8.23	8.00	9.94	-------	9.94	10.00	2.88	2.47	35.68	35.00	796

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	UNION CHEMICAL WORKS, INC., NORTH WALES, PA.		
1758	High Grade Vegetable Guano,	Henry K. Nohr, Quakertown,	7.37
113	†Ideal Potato Manure, Planting Brand,	H. D. Sittler, Trexlertown,	9.34
191		N. W. Stroup, Elizabethville,	
1759	†Potato and Celery Special,	Henry K. Mohr, Quakertown,	9.77
1775		Christian Kreider, Myerstown,	
	UNITED STATES FERTILIZER CO., BALTIMORE, MD.		
27	†Farm Bell Animal Ammoniated,	J. N. Getz Co., Lock Haven,	7.05
227		J. Chester Bell, Gettysburg, R. D. 2,	
245	†Farm Bell Fruit and Potato Guano,	Biglerville Warehouse, Biglerville,	7.74
25		J. N. Getz, Lock Haven,	
446		Henry P. Brown, Laurys,	
1310	†Farm Bell Pennant Winner,	J. M. Bartenslager, Stewartstown,	8.39
1895		J. J. Shoemaker, Walnutport,	
1573	Farm Bell Potato and Tobacco Guano,	Fred Seely, Beach Haven,	6.97
226	Farm Bell Standard Guano,	J. Chester Bell, Gettysburg, R. D. 12.	4.39
445	Farm Bell Trucker's Favorite 4-6-8,	Henry P. Brown, Laurys,	7.29
444	†Farm Bell Wheat, Oat, Corn Special, 1-8-6.	Henry P. Brown,	6.06
684		A. L. Grove, Mifflinburg,	
	VIRGINIA CAROLINA CHEMICAL CO., FOR RESALE BY RASIN MONUMENTAL CO., BALTIMORE, MD.		
1594	V. C. C. Co.s Fish, Bone and Potash,	N. H. Diemer, Brookville,	10.11
693	†V. C. C. Co.'s National Ammoniated Guano.	J. R. Weaver & Bro., New Oxford,	11.80
1240		Isaac Kunkle, Winfield, R. F. D.,	
1592		N. H. Diener, Brookville,	
1241	V. C. C. Co.'s Prize Potato Manure,	J. R. Weaver & Bro., New Oxford,	9.22
1591	†V. C. C. Co.'s Standard Corn and Grain Grower.	N. H. Diener, Brookville,	8.45
1685		McCalmont & Co., Belefonte,	
	JOS. C. WALKER & SONS CO., GAP, PA.		
981	Pride of Pequa High Grade,	Jos. C. Walker & Sons Co., Gap,	6.27
982	Pride of Pequa,	Jos. C. Walker & Sons Co., Gap,	9.89
	W. E. WHANN CO., PHILADELPHIA, PA., BY A. A. C. CO., NEW YORK.		
1762	Whann's Chester Valley Economist Fert.,	Milton Johnson, Quakertown,	11.06
440	Whann's Chester Valley 15% Guano,	Allen M. Gehman, Macungie,	9.62
800	Whann's Chester Valley Special Potato and Truck Fertilizer.	J. A. Gill, Richboro,	9.76
439	Whann's Chester Valley 10% Potato Manure.	Allen M. Gehman, Macungie,	8.94
	ROBERT A. WOOLDRIDGE, TRADING AS THE WOOLDRIDGE FERTILIZER CO., BALTIMORE, MD.		
744	†Tiger Phosphate,	S. B. Jackson, Carlisle,	7.86
1338		Grant Johnson, Millville,	
	ROBERT A. WOOLDRIDGE CO., BALTIMORE, MD.		
694	†Wooldridge's Triumph Brand Phosphate,	Bennage & Dersham, White Deer,	10.57
307		F. G. Evans, Kelton,	
1295		Geo. B. Murphy, Red Lion,	
746	†Wooldridge's Champion Giant Phosphate,	S. B. Jackson, Carlisle,	11.12
696		Bennage & Dersham, White Deer,	
1814		S. S. Sheeler, Duncannon,	

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†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen. in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
7.72	7.00	.73	8.45	8.00	7.35	-------	7.35	7.00	3.46	3.28	35.90	35.00	1758
8.52	8.00	.11	*8.63	9.00	6.53	3.21	*9.74	10.00	*3.06	3.28	37.80	42.00 -------	113 191
7.49	7.00	.26	*7.75	8.00	7.33	2.51	9.84	10.00	1.61	1.65	30.13	23.75 27.50	1759 1775
8.16	8.00	1.11	9.27	9.00	6.43	-------	6.43	5.00	1.54	1.65	24.85	27.00 23.50	27 227
8.33	8.00	.94	9.27	9.00	9.93	-------	9.93	10.00	1.73	1.65	31.41	27.50 32.00 26.35	245 25 440
8.47	8.00	.73	9.20	9.00	4.59	-------	4.59	4.00	.95	.82	22.40	20.00 20.30	1310 1895
7.72	7.00	.94	8.66	8.00	9.67	-------	*9.67	10.00	*1.78	2.46	30.76	30.00	1573
7.51	8.00	1.44	8.95	9.00	3.25	-------	3.25	2.00	1.73	1.65	24.04	20.00	226
6.89	6.00	.92	7.81	7.00	7.77	-------	*7.77	8.00	*3.02	3.28	33.46	30.00	445
8.27	8.00	.51	*8.78	9.00	6.53	-------	6.53	6.00	.91	.82	23.90	19.95 ------	444 684
8.12	8.00	3.07	11.19	9.00	3.70	-------	3.70	3.00	*1.32	1.65	23.89	22.50	1594
*7.08	8.00	3.25	10.33	9.00	4.01	-------	4.01	4.00	.83	.82	21.17	------ 18.50 21.00	693 1240 1592
6.77	6.00	2.55	9.32	7.00	4.40	.47	*4.87	6.00	*1.38	1.65	29.68	22.50	1241
8.46	8.00	1.61	10.07	9.00	1.94	-------	1.94	2.00	.43	.41	15.10	18.00 20.00	1591 1685
6.89	7.00	.82	7.71	-------	2.66	5.20	7.86	8.00	2.53	2.47	32.71	29.00	981
10.44	10.00	.78	11.22	-------	3.49	-------	3.49	3.00	2.56	2.47	30.62	25.00	982
8.23	8.00	.73	8.96	9.00	2.25	-------	2.25	2.00	.50	.41	17.72	19.00	1762
7.44	7.00	.81	8.25	8.00	13.75	-------	*13.75	15.00	1.46	.82	33.02	30.00	440
7.54	7.00	.85	8.39	8.00	7.33	-------	7.33	7.00	2.47	2.47	31.18	-------	800
7.36	6.00	.65	8.01	7.00	9.77	-------	*9.77	10.00	*2.38	3.29	33.10	34.50	439
8.19	8.00	.66	8.85	8.50	5.13	-------	5.13	4.50	1.24	1.03	24.03	22.50 21.00	744 1338
8.64	8.00	1.58	10.22	9.00	4.36	-------	4.36	4.00	1.06	1.23	23.17	22.00 24.00 20.00	694 307 1295
8.92	9.00	1.25	10.17	10.00	2.08	-------	2.08	2.00	1.05	.82	21.02	19.75 19.00 22.00	745 696 1814

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
937	Wooldridge's Farmer's Favorite Cereal Compound.	Grant Wiggins, New Providence, R. D.	10.75
219	†Wooldridge's Fernwood Grange Mixture	A. M. Brandt & Son, Dillsburg,	11.42
70		J. G. Sully, Richfield,	
306		F. G. Evans, Kelton,	
695	†Wooldridge's Special Potato and Tobacco Fertilizer.	Bennage & Dersham, White Deer,	9.76
746		S. B. Jackson, Carlisle,	
	YORK CHEMICAL WORKS, YORK, PA.		
1646	Dempwolf's Crop Grower,	A. C. Fendricks, Mercersburg,	10.33
1230	Dempwolf's Golden Sheaf,	D. E. Brandt, East Berlin,	10.85
1361	†Dempwolf's Potato and Truck Special,	G. O. Fenstermacher, Tamaqua,	7.89
1233		H. M. Berkheimer, Abbottstown,	
1459		Hershey Store Co., Hershey,	
648	†Dempwolf's Harvest Queen,	Chas. Edelman, Bath,	12.39
199		A. C. Rutter, Halifax,	
903		E. D. Dewksburg, Catawissa, R. D. 5	
1839	Dempwolf's Plow Brand,	Kirkland & Wright, Girard,	13.22
1258	†Dempwolf's Potato Manure,	M. J. Sheffer, Hanover,	10.35
646		Chas. Edelman, Bath,	
1359		G. O. Fenstermacher, Tamaqua, R. D.	
337	†Dempwolf's Special Tobacco,	Holmes Seed Co., Harrisburg,	6.28
1360		G. O. Fenstermacher, Tamaqua, R. D. 5.	
993	†Dempwolf's Standard Potash,	W. K. Bender, Strasburg,	11.54
647		Chas. Edelman, Bath,	
1043		J. H. Edmiston, Petersburg,	
	HENRY S. ZOOK, ELVERSON, PENNA.		
1662	No. 7 Pride of Chester Wheat, Corn and Potato Phosphate.	Chas. Geiger (purchased from factory for own use), Scarlett Mill,	10.84

†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen. in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Total.			Available.				Total.						
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Found.	Guaranteed.			
7.40	7.00	.80	8.20	8.00	2.27	-------	2.27	2.00	.74	.41	18.04	17.50	937
8.19	8.00	1.43	9.62	9.00	8.24	-------	8.24	8.00	1.76	1.65	29.83	27.00 27.00 26.00	219 70 306
8.81	9.00	1.24	10.05	10.00	5.14	-------	5.14	5.00	1.84	1.65	27.67	24.00 26.00	695 746
9.21	8.00	.54	9.75	8.50	1.35	-------	1.35	1.00	.76	.82	18.85	16.00	1646
7.84	8.00	1.90	9.74	8.50	2.61	-------	2.61	2.00	.45	.29	18.02	15.00	1230
8.78	8.00	.92	9.70	9.00	4.00	3.02	7.02	7.00	2.72	2.47	33.98	30.00 31.00 34.00	1361 1233 1459
8.28	8.00	1.13	9.41	8.50	2.32	-------	2.32	2.00	.87	.82	19.59	18.40 17.50 18.00	648 199 903
8.24	8.00	1.07	9.31	9.00	2.58	-------	2.58	2.00	1.65	1.65	23.49	23.00	1839
7.05	6.00	1.05	8.10	6.50	6.96	-------	6.96	7.00	.81	.82	22.83	24.00 22.00 22.00	1258 646 1359
5.87	5.00	.74	6.61	5.50	6.66	3.51	10.17	10.00	*3.09	3.29	36.06	------ 36.00	337 1360
7.85	8.00	1.09	8.94	8.50	5.38	-------	5.38	4.00	.88	.82	22.54	22.00 24.00 20.25	993 647 1043
8.37	8.00	1.82	10.19	9.00	5.36	-------	*5.36	6.00	*1.27	1.65	24.99	26.50	1662

*Constituent falls below guaranty.

ROCK AND POTASH

Furnishing Phosphoric

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	ALLENTOWN MANUFACTURING CO., ALLENTOWN, PA.		
634	High Grade Phosphate and Potash,	Mr. Fenstermaker, Allentown,	10.76
	AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK.		
123	†Big Crop Phosphate,	W. D. Gates, Curwensville,	9.71
81		S. O. Wright, Zelienople,	
362		C. B. Gochenour, Lititz,	
640	Gem Alkaline Phosphate,	John Anthna, Bath, R. D.,	7.17
457	†High Grade Phosphate and Potash,	J. P. Griffith & Son, Nichols, N. Y.	10.39
112		J. H. Geisler, Trexlertown,	
645		T. M. Kunkel, Bath,	
512	†High Grade Potash Mixture,	A. Skelly, Ebensburg,	9.40
458		J. P. Griffith & Son, Nichols, N. Y.	
590		O. P. Beebe, Montrose,	
1	Reese's Wheat Special,	Harry Keefer, Pine Grove, R. D.,	10.79
1444	†Bradley's Alkaline Phosphate & Potash,	Geo. R. Andrews, Enon Valley,	7.63
1578		John Shaffer, Knox,	
580	Crocker's Alkaline Bone and Potash,‡	J. A. Williams, Friendsville,	11.58
92	†Crocker's Dissolved Phosphate & Potash,	W. H. Kaufman, Harmony,	11.56
847		L. P. Armer, Orangeville, O.,	
1867	Maryland Linden Superphosphate,	S. M. Shuler & Son, Liverpool,	9.51
1961	Maryland Tornado Fertilizer,	L. R. Over, Curryville,	9.01
1828	Michigan Carbon Works Red Line Phosphate with Potash.	Biebel Bros., Kearsarge,	11.01
223	Michigan Carbon Works Wheat and Grass Fertilizer.	Wm. F. Howe, York Springs, R. D.,	9.01
844	Milsom's Dissolved Phosphate and Potash,	A. C. Lininger, Greenville,	10.93
759	Moro-Philips Alkaline Phosphate,	Nickles & Stewart, Shippensburg,	10.33
1270	Moro-Philips Great Crop Fertilizer,	Zinn Bro., West York,	7.89
1083	Moro-Philips Wheat Special,	Kingsloe & Ewing, Newton Hamilton	10.07
632		Peter Haughenbrach, Nazareth,	
1942		H. G. Luker, Kittanning,	
101	Northwestern X. X. X. Alkaline Phosphate	J. J. Mitman, Bethlehem,	10.16
67		W. W. Shirk, Oakland Mills,	
1657		Wm. Zettlemoyer (pur. from factory for own use), Lenhartsville.	
495	†Northwestern Dissolved Phosphate and Potash.	I. M. Sheets, Sunbury R. D. 3,	10.13
641		James Spengler, Bath,	
1584	Quinniapiack Dissolved Phosphate and Potash.	Farmers' Hdw. Co., Shippensvile,	8.82
1572	Read's High Grade Special,	Elliott Hill, Beach Haven,	8.93
1353	†Sharpless & Carpenter's Soluble Phosphate and Potash.	Jonas Kunkle, New Ringgold, R. D.	11.48
1383		Wm. J. Davis, Lionville,	
769	†Susquehanna High Grade Phosphate and Potash.	Percy Harman, Mt. Holly,	9.79
201		P. A. Enders, Halifax, R. No. 1,	
1209		A. A. Miller, Somerset, R. F. D. 4,	
1400	†William's & Clark's Dissolved Phosphate and Potash.	Thos. Crayton, Leroy,	10.65
326		A. Steen & Co., Elwyn,	
194		McConnell & Watterson Co., Kittanning.	
540	†Zell's Electric Phosphate,	Chas. H. Kistler, Slatington, R.D. 2	.39
55		W. B. Shirk, Oakland Mills,	
1794		B. F. Horting, Newport,	

†Composite sample. ‡No Bone present.

FERTILIZERS.

Acid and Potash.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Available.			Total.				Total.				
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.			
12.79	12.00	.60	13.39	13.00	5.76	--------	*5.76	6.00	19.70	19.00	634
8.00	8.00	1.20	9.28	9.00	5.11	--------	5.11	5.00	15.87	22.00 22.00 17.00	123 81 362
6.93	7.00	.93	7.86	6.00	3.32	--------	3.32	3.00	15.30	--------	6.40
11.92	12.00	.77	*12.69	13.00	5.57	--------	5.57	5.00	18.92	18.85 18.00 22.00	457 112 645
10.24	10.00	.65	10.89	11.00	10.02	--------	10.02	10.00	22.22	22.00 21.70 23.00	512 458 590
10.49	10.00	.54	11.03	11.00	2.42	--------	2.42	2.00	14.41	15.00	1
10.07	10.00	1.71	11.78	11.00	2.34	--------	2.34	2.00	14.68	16.15 18.00	1444 1578
12.13	12.00	.42	*12.55	13.00	5.02	--------	5.02	5.00	18.39	18.00	580
9.98	10.00	1.75	11.73	11.00	1.98	--------	1.98	2.00	14.28	16.00 -------	92 847
11.13	11.00	.77	11.90	12.00	2.51	--------	2.51	2.00	15.30	15.00	1867
12.02	12.00	.79	12.81	13.00	5.61	--------	5.61	5.00	19.04	18.00	1961
9.87	10.00	1.72	11.59	11.00	4.90	--------	4.90	2.00	17.11	17.00	1828
8.42	8.00	.75	9.17	9.00	5.06	--------	5.06	5.00	15.87	15.00	223
9.83	10.00	2.45	12.28	11.00	2.92	--------	2.92	2.00	15.34	16.00	844
10.20	10.00	.70	10.90	11.00	1.99	--------	1.99	2.00	14.04	14.50	759
8.48	8.00	.79	9.27	9.00	5.16	--------	5.16	5.00	16.06	15.25	1270
10.61	10.00	.74	11.35	11.00	2.29	--------	2.29	2.00	14.66	15.75 ------- 22.00	1083 632 1942
10.42	10.00	.61	11.03	11.00	5.14	--------	5.14	5.00	17.40	------- ------- 14.60	101 67 1657
9.91	10.00	.84	*10.75	11.00	2.39	--------	2.39	2.00	17.26	15.00 14.00	495 641
10.35	10.00	2.18	12.53	11.00	2.08	--------	2.08	2.00	14.79	15.00	1584
12.19	12.00	.84	13.03	13.00	4.75	--------	*4.75	5.00	18.34	17.00	1572
10.98	10.00	.57	11.55	11.00	2.23	--------	2.23	2.00	14.82	14.00 16.00	1353 1383
12.44	12.00	.66	13.10	13.00	5.29	--------	5.29	5.00	19.02	18.50 ------- 18.00	769 201 1209
10.16	10.00	.87	11.03	11.00	2.38	--------	2.38	2.00	14.79	14.25 16.00 20.00	1400 326 1941
10.32	10.00	.87	11.19	11.00	2.38	--------	2.38	2.00	14.61	16.00 14.50 12.50	540 55 1794

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	AMERICAN FERTILIZING CO., BALTIMORE, MD.		
406	†Dissolved Phosphate and Potash,	Jones Eavenson, Christiana,	10.89
1227		A. F. Brown, East Berlin,	
1550	†American Special Potash Mixture,	J. H. Neidigh, State College,	8.84
1636		J. W. Glatfelter, Rossville,	
792	American Special Superphosphate,	George Watson, Embreesville,	6.81
	ARMOUR FERTILIZER WORKS, BALTIMORE, MD.		
461	†Banner Brand,	Lott Shoemaker, Nichols, N. Y.,	8.92
142		Albee & Sultz, Port Allegany,	
607		Sewel Bowser, Alum Bank,	
462	†Phosphate and Potash No. 1,	Lott Shoemaker, Nichols, N. Y.,	8.24
129		C. O. Salberg, Ridgeway,	
666		Wm. Wood, Osceola Mills,	
660	Potash Mixture,	Wm. Wood, Osceola Mills,	7.28
141		Albee & Sultz, Port Allegany,	
872		Louck's Hardware Co., Scottdale,	
868	†Sure Crop,	Louck's Hardware Co., Scottdale,	9.02
37		S. G. Updegraff, Williamsport,	
980		Jos. C. Walker & Sons Co., Gap,	
	ATLANTIC FERTILIZER CO., BALTIMORE, MD.		
1931	High Grade Potash Compound,	S. J. Sider, Blacklick,	9.38
1263	Jumbo Crop Grower,	H. H. Loose, Menges Mills,	8.19
	BALTIMORE PULVERIZING CO., BALTIMORE, MD.		
952	†Corn and Grain Grower,	E. B. Fritz & Son, Quarryville,	8.37
1222		J. D. Gochenour, Dillsburg,	
	BALTIMORE FERTILIZER CO., BALTIMORE, MD.		
951	Special Spring and Fall Mixture,	E. B. Fritz & Son, Quarryville,	5.08
229	Honest 8 and 3,	I. N. Lightner, Gettysburg,	8.76
	BAUGH & SONS CO., PHILADELPHIA, PA.		
1261	†Baugh's 8 and 5 Special Alkaline,	M. J. Sheffer, Hanover,	7.56
764		S. E. Shenk, Newville,	
1870		Long & Miller, Liverpool,	
765	†Baugh's Soluble Alkaline Superphosphate,	S. E. Shenk, Newville,	8.34
622		D. C. Kert & Son, Orbisonia,	
767		John A. Miller, Oakville,	
	BOWKER FERTILIZER CO., NEW YORK, N. Y.		
1521	Bowker's Empire State Phosphate and Potash.	C. F. Craig, Sligo,	4.60
1129	†Bowker's Golden Harvest Fertilizer,	E. R. Thomas, Springville,	11.40
1559		H. B. Harned, Caverton,	
1191	Bowker's Superphosphate with Potash,	Murray & Co., Honesdale,	13.22
20	Bowker's Superphosphate with Potash for Grass and Grain.	George Maurer, Pitman,	10.24
	BUFFALO FERTILIZER CO., BUFFALO, N. Y.		
1576	†General Crop,	R. C. Bower, Beach Haven,	7.93
1507		The Bennett Hdw. Co., Emlenton,	
1612		Snyder Bros., Liberty,	

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†Composite sample.

FERTILIZER—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Available.			Total.				Total.				
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.			
10.29	10.00	1.25	11.54	11.00	2.38	--------	2.38	2.00	14.72	13.00 13.25	406 1227
7.87	8.00	.93	*8.80	9.00	3.92	--------	3.92	4.00	14.38	15.00 17.00	1550 1636
6.92	6.00	.59	7.51	7.00	2.97	--------	2.97	3.00	12.60	14.00	792
10.22	10.00	.62	10.84	10.50	8.16	--------	8.16	8.00	20.31	21.00 24.00 19.50	461 142 607
10.10	10.00	.74	10.84	10.50	2.36	--------	2.36	2.00	14.98	17.00 18.00 20.00	462 129 666
6.15	6.00	.54	6.69	6.50	2.91	--------	2.91	3.00	12.00	18.00 16.00 17.00	669 141 872
8.17	8.00	.56	8.73	8.50	5.08	--------	5.08	5.00	15.72	20.00 20.00 16.00	868 37 980
*10.63	12.00	.73	*11.36	13.00	4.94	--------	4.94	5.00	17.36	20.00	1931
7.84	8.00	.42	*8.26	9.00	5.32	--------	5.32	5.00	15.61	16.50	1263
9.56	10.00	1.45	11.01	--------	2.94	--------	2.94	2.25	14.82	15.50 15.50	952 1222
*7.62	8.00	1.07	8.69	--------	1.89	--------	1.89	1.25	12.21	13.50	951
8.66	8.00	.88	9.54	9.00	3.51	--------	3.51	3.00	14.53	16.00	229
8.51	8.00	.57	9.08	--------	5.50	--------	5.50	5.00	16.35	15.00 15.00 15.50	1261 764 1870
10.24	10.00	.52	10.76	--------	2.18	--------	2.18	2.00	14.20	14.00 16.50 15.00	765 622 767
8.27	8.00	.88	9.15	9.00	3.32	--------	3.32	3.00	14.06	18.00	1521
12.39	12.00	1.01	13.40	13.00	4.85	--------	4.85	5.00	18.63	19.50 21.00	1129 1559
10.28	10.00	3.25	13.53	11.00	1.01	--------	1.01	1.00	14.01	15.00	1191
10.67	10.00	.74	11.41	11.00	2.10	--------	2.10	2.00	14.49	16.00	20
9.24	9.00	1.66	10.90	10.00	3.11	--------	3.11	3.00	14.83	16.00 22.00 15.00	1576 1507 1612

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	CENTRAL CHEMICAL CO., HAGERSTOWN, MD.		
1671	C. C. C. Great Southern,	D. O. Nicodemus, Zullingniger,	7.83
768	Majestic,	John K. Beidler & Son, Oakville,	6.49
750		J. S. Craig, Shippensburg,	
1673		Sollenberger & Croft, Fayetteville,	
	CHESAPEAKE CHEMICAL CO., BALTIMORE, MD.		
929	C. C. Co.'s Celebrated Mixture,	New Providence Coal Co., New Providence.	11.46
252	C. C. Co.'s Reliable Phosphate,	Aspers Milling and Produce Co., Aspers.	10.29
	COLUMBIA GUANO CO., BALTIMORE, MD.		
1055	Columbia Double Ten Potash Mixture,	James Miller, Montgomery,	11.07
1388	†Columbia Grass and Grain Grower,	E. L. Shepard, New Albany,	7.39
1505		L. A. Geiger, Joanna,	
715	Columbia Premium Phosphate and Potash,	E. M. Twigley, Kingsley,	9.51
1387	†Columbia Prize Crop Phosphate,	E. L. Shepard, New Albany,	8.17
1054		James Miller, Montgomery,	
1501		L. A. Geiger, Joanna,	
	COE-MORTIMER CO., NEW YORK, N. Y.		
1136	†E. Frank Coe's High Grade Dissolved Phosphate and Potash.	C. B. Easterbrook, Rummersfield,	11.13
1173		Everitt Berthamew, Saylorsburg, R. F. D. 2.	
471	E. Frank Coe's Golden Harvest,	C. B. Easterbrook, Rummersfield,	10.74
	JOSIAH COPE & CO., Baltimore, MD.		
401	†Josiah Cope & Co. Soluble Phosphate and Potash.	Jonas Eavenson, Christiana,	11.23
790		George Watson, Embreeville,	
1039	†Josiah Cope & Co. High Grade Phosphate and Potash.	J. C. Henderson, Petersburg,	8.67
405		Jones Eavenson, Christiana,	
1725		J. H. Hershberger, Everett,	
	JAMES G. DOWNWARD CO., COATESVILLE, PA.		
940	Soluble Phosphate and Potash,	Michael Scott, Quarryville, R. D. 4,	10.89
	AMOS EBY & CO., LEAMAN PLACE, PA.		
925	Farmer's Mixture,	Harvey S. Eby, Refton,	10.71
924	Pequa Crop Grower,	Harvey S. Eby, Refton,	11.38
	EUREKA FERTILIZER CO., PERRYVILLE, MD.		
1169	†Alkaline No. 2,	W. F. Slagle, Bloomsburg,	14.49
42		D. J. Shock, Montoursville,	
1864		T. W. Tressler, Wila,	
69	Alkaline No. 5,	L. Arnold, Pfouts Valley,	13.09
194	†Alkaline No. 8,	L. Arnold, Liverpool,	8.77
676		M. C. Catherman, Milmont, R. F. D.	
683	Crop Grower,	Geo. W. Zimmerman, Cowan,	12.48
	W. S. FARMER & CO., BALTIMORE, MD.		
1737	Farmer & Co.'s B. & P. Phosphate,	P. J. Cover & Son, Meyerdale,	9.63

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†Composite sample.

FERTILIZER—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Available.			Total.				Total.				
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.			
14.06	10.00	.46	14.52	11.00	5.33	--------	5.33	5.00	20.14	17.00	1671
8.40	8.00	1.21	9.61	9.00	4.92	--------	*4.92	8.00	15.88	17.00 -------- 15.00	763 750 1673
*9.59	10.00	1.66	12.25	11.00	2.32	--------	2.32	2.00	14.26	13.50	929
11.50	10.00	.99	12.49	11.00	3.78	--------	*3.78	4.00	16.92	17.00	252
13.38	10.00	.26	13.64	10.50	9.59	--------	*9.59	10.00	23.94	--------	1055
*9.70	10.00	.59	*10.29	10.50	2.30	--------	2.30	2.00	13.95	16.00 13.00	1388 1505
*9.70	10.00	.59	*10.29	10.50	2.50	--------	*7.51	8.00	19.24	--------	715
8.36	8.00	.48	8.84	8.50	5.11	--------	5.11	5.00	15.80	18.00 -------- 15.00	1387 1054 1501
8.10	8.00	1.30	9.40	9.00	5.07	--------	5.07	5.00	15.85	14.00 16.50	1136 1173
10.36	10.00	.94	11.30	11.00	7.77	--------	*7.77	8.00	20.11	17.25	471
10.15	10.00	1.13	11.28	11.00	2.24	--------	2.24	2.00	14.42	14.00 15.00	401 790
10.24	10.00	.51	*10.75	11.00	5.45	--------	5.45	5.00	17.52	17.00 17.00 20.00	1039 405 1725
*8.69	9.00	.56	*9.25	10.00	3.46	--------	*3.46	4.00	17.00	17.00	940
11.44	10.00	.80	12.24	11.00	5.08	--------	5.08	5.00	18.14	17.00	925
11.56	10.00	.83	12.39	11.00	6.43	--------	*6.43	7.00	19.60	18.00	924
11.02	10.00	1.16	12.18	11.00	2.81	--------	2.81	2.00	15.63	15.00 15.50 --------	1169 42 1864
12.54	12.00	1.49	14.03	13.00	5.46	--------	5.46	5.00	19.53	22.00	69
8.91	8.00	1.11	10.02	9.00	10.63	--------	10.63	8.00	22.06	-------- --------	194 676
10.88	6.00	.94	11.82	7.00	3.57	--------	3.57	3.00	16.18	--------	683
9.97	10.00	1.16	11.13	11.00	2.24	--------	2.24	2.00	15.03	20.00	1737

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	GRIFFITH & BOYD CO., BALTIMORE, MD.		
61	†Monarch Brand,	B. F. Gayman, Thompsontown,	9.18
87		Harmony Cereal Mills, Harmony,	
996	†X. X. Potash Manure,	W. C. Herr, Strasburg,	10.95
301		Passmore & Co., Nottingham,	
1631		H. W. Rehmeyer, Turnpike,	
239		H. J. Van Dyke, Gettysburg, R. D. 6.	
64	†Special Grain Grower,	B. F. Gayman, Thompsontown,	11.08
911		Wm. Champerlain, Christiana,	
	S. M. HESS & BRO., INC., PHILADELPHIA, PA.		
197	S. M. Hess & Bros. Emperor Phosphate,	Harvey Smeltzer, Milersburg, R. No. 2.	9.22
1711	S. M. Hess & Bros. Farmer's Grain and Clover Grover.	Ira Price, Everett, R. D. 5,	9.52
624	†S. M. Hess & Bros. Soluble Phosphate and Potash.	Jno. M. Bush, Shirleysburg,	11.83
339		J. B. Landis, Middletown, R. D.,	
1166		J. P. Horlacher, Beaver Valley,	
230	†S. M. Hess & Bros. Standard Alkaline,	J. S. Smith, Gettysburg, R. D. 3,	10.99
108		H. T. Troxell, Allentown, R. D. 3,	
679		J. R. Iddings, Mifflinburg, R. F. D.	
	HUBBARD FERTILIZER CO., THE, BALTIMORE, MD.		
1743	†Hubbard's Corn and Buckwheat, 6 & 3,	S. B. Alcott, Ursina,	7.44
1306		D. J. Trout, Stewartstown,	
1913		Hartley & Blaine, Turbotville,	
484	†Hubbard's Special Mixture, 10 & 4,	J. P. Hill, Muncy, R. D.,	11.71
244		Biglerville Warehouse Co., Biglerville	
1745		S. B. Alcott, Ursina,	
	KEYSTONE BONE FERTILIZER CO., INC., PHILADELPHIA, PA.		
1162	Keystone 8 & 5,	J. E. Houck, Catawissa, R. D.,	6.21
	LANCASTER CHEMICAL CO., THE, LANCASTER, PA.		
50	†No. 13 Special Potash Manure,	C. S. Winey, McAllisterville,	11.44
1637		C. J. Bushey, Dillsburg,	
	LANCASTER BONE FERTILIZER CO., LANCASTER, PA.		
509	†Special Grange Mixture,	Wm. R. Rowland, Ebensburg, R. D. 2.	8.12
1902		David Schultz, Jerseytown,	
	LISTER'S AGRICULTURAL CHEMICAL WORKS, NEWARK, N. J.		
566	†Lister's Grain and Grass Fertilizer,	Morrow & Buxton, Valencia,	9.05
503		C. F. Shaffer, Dalmatia,	
702		Calvin Deakin, Susquehanna,	
1529	†Lister's 10% Alkaline Potato Fertilizer,	J. M. Zook, Belleville,	12.12
1150		Zehner Bros., Bloomsburg,	
1804		I. B. Secrist, Millerstown,	
148	†Lister's Potash Mixture,	Sylvester Garr, Easton, R. F. D. 1,	9.51
913		B. F. Walter, Christiana,	

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†Composite sample.

FERTILIZER—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Available.			Total.				Total.				
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.			
8.15	8.00	2.51	10.66	9.00	3.34	--------	*3.34	5.00	14.59	------- 17.00	61 87
10.06	10.00	2.28	12.34	11.00	4.46	--------	*4.46	5.00	17.00	20.00 17.00 15.00	996 301 1631
9.87	10.00	2.03	11.90	11.00	2.48	--------	2.48	2.00	14.80	15.00 ------- -------	239 64 911
10.33	10.00	.82	11.15	11.00	1.32	--------	1.32	1.00	13.47	--------	197
10.05	10.00	.98	11.07	11.00	7.66	--------	*7.66	8.00	19.80	21.50	1711
10.50	10.00	.89	11.39	11.00	2.28	--------	2.28	2.00	14.64	16.00 15.00 15.50	624 339 1166
8.68	8.00	.61	9.29	9.00	4.99	--------	4.99	5.00	15.98	16.00 17.00 16.00	230 108 679
8.27	6.00	1.44	9.71	7.00	3.25	--------	3.25	3.00	14.18	14.00 16.00 1375	1743 1306 1913
10.79	10.00	1.26	12.05	11.00	4.12	--------	4.12	4.00	16.82	14.25 17.00 18.00	484 244 1745
*7.69	8.00	.74	*8.43	9.00	5.99	--------	5.99	5.00	16.34	15.50	1162
*9.51	10.00	1.42	10.93	11.00	4.00	--------	*4.00	5.00	15.86	16.95 16.00	50 1637
9.90	10.00	.32	*10.22	12.00	8.31	--------	8.31	8.00	20.11	22.00 19.50	509 1902
9.24	9.00	.65	9.89	10.00	4.92	--------	4.92	5.00	16.30	25.50 16.00 21.00	566 503 702
8.72	8.00	.64	9.36	9.00	10.10	--------	10.10	10.00	21.21	22.00 21.00 19.50	1529 1150 1804
8.98	8.00	.57	9.55	9.00	7.97	--------	7.97	5.00	19.17	26.00 16.00	148 913

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	FREDERICK LUDHAM CO., BALTIMORE, MD.		
960	Ludlam's Cecrop Fertilizer's Economy,	W. J. Hess, Quarryville,	7.13
958	†Ludlam's Cecrop Fertilizer, I. X. L. Brand.	W. J. Hess, Quarryville,	8.66
649		Geo. Rafferty, Grampian,	
1096		S. A. Hostetler, Belleville,	
	D. B. MARTIN CO., PHILADELPHIA, PA.		
4	Martin's Potash and Soluble Phosphate No. 4.	J. K. Miller, Summit Sta.,	9.15
152	Martin's Potash and Soluble Phosphate No. 2.	Ed. Houck, Bangor,	10.85
	MILLER FERTILIZER CO., BALTIMORE, MD.		
1074	Miller's Potash Mixture,	Howard Klinger, Selinsgrove,	8.28
945	Special Alkaline,	S. M. Book & Bro., Quarryville,	6.63
	G. OBER & SONS CO., Baltimore, MD.		
1412	Ober's Big (4) Special Fertilizer,	S. J. Louther, Carroltown,	5.13
	PATAPSCO GUANO CO., BALTIMORE, MD.		
233	†Patapsco Alkaline Plant Food,	E. C. Thomas, Gettysburg,	9.31
54		W. E. Harley, Thompsontown,	
493		Walter & Frederick, Montandon,	
1237	†Patapsco Phospho Potash,	J. N. Hersh, New Oxford,	10.42
1061		G. W. Robison, Allenwood,	
1818		Jacob Fritz, New Bloomfield,	
75	Patapsco Soluble Phosphate and Potash,	G. A. Harley, Warrendale,	9.89
	J. D. PERKINS SONS, PHILADELPHIA, PA.		
826	Perkins Globe Phosphate,	Edward Tingley, New London,	8.03
	PIEDMONT MT. AIRY GUANO CO., BALMORE, MD.		
1032	Piedmont Farmer's Potash Mixture,	J. G. Simpson, Huntingdon,	7.22
1688	†Piedmont Soluble Phosphate and Potash,	J. G. Dubbs, Bellefonte,	6.79
139		A. M. Haupt, Emporium,	
1806		A. H. Ulsh, Millerstown,	
140	Piedmont Special Potash Mixture,	S. M. Haupt, Emporium,	8.73
209	Piedmont Success,	Geo. H. Hallman, Hummelstown, R. No. 1.	9.29
	RASIN MONUMENTAL CO., BALTIMORE, MD.		
1082	†Rasins' Phosphate and Potash Fertilizer,	Isaac Shirley, McClure,	12.47
1048		Francis Archey, Penna.. Furnace,	
1153		H. D. Miller, Mifflinville,	
689	†Rasin's Wheat and Truck Mixture,	S. B. Miler, Mifflinburg, R. F. D.,	10.74
251		Aspers Milling and Produce Co., Aspers.	
1152		H. D. Miller, Mifflinville,	
	READING BONE FERTILIZER CO., READING, PA.		
691	†Economy Brand,	Joseph Lepley, Winfield, R. F. D.,	6.29
1381		A. B. Piersol, Coatesville,	
256	†High Grade Potash Mixture,	Grover C. Myers, Idaville,	10.23
19		Samuel Savidge, Valley View, R. F. D.	
819		H. B. Rosenberger, Doylestown,	

†Composite sample.

FERTILIZER—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Available.			Total.				Total.				
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.			
6.82	6.00	.60	7.42	7.00	3.04	--------	3.04	3.00	12.62	14.00	960
8.85	8.00	.62	9.47	9.00	5.01	--------	5.01	5.00	16.09	16.00 18.00 16.50	958 649 1096
8.15	8.00	.41	8.56	--------	4.97	--------	4.97	5.00	17.91	16.00	4
10.04	10.00	.48	10.52	--------	2.40	--------	2.40	2.00	14.23	13.00	152
9.98	10.00	.82	10.80	10.50	5.75	--------	5.75	5.00	17.76	--------	1074
7.90	8.00	.64	8.54	8.50	6.12	--------	6.12	5.00	16.56	16.00	945
*7.33	8.00	.45	*7.78	9.00	5.35	--------	5.35	4.00	15.32	17.00	1412
8.52	8.00	.66	9.18	9.00	5.13	--------	5.13	5.00	16.05	16.00 -------- 15.00	233 54 493
6.93	6.00	.57	7.50	7.00	3.10	--------	3.10	3.00	12.78	15.00 15.00 15.00	1237 1061 1818
9.97	10.00	1.35	11.32	11.00	2.06	--------	2.06	2.00	14.14	25.00	75
10.38	10.00	.66	11.04	11.00	2.00	--------	2.00	2.00	14.17	17.00	826
9.30	10.00	1.52	10.82	--------	1.75	--------	*1.75	2.00	13.42	15.00	1032
*7.48	8.00	1.35	8.83	--------	2.60	--------	2.60	2.00	12.94	16.50 18.50 14.00	1688 139 1856
9.83	10.00	.19	10.02	--------	5.46	--------	5.46	5.00	15.16	21.00	140
8.99	9.00	.14	9.13	--------	4.45	--------	*4.45	5.00	15.48	18.00	209
10.41	10.00	1.17	11.58	11.00	2.25	--------	2.25	2.00	14.61	13.50 -------- 17.00	1082 1048 1153
10.01	10.00	1.34	11.35	11.00	8.48	--------	8.48	8.00	20.77	-------- 20.00 21.00	689 251 1152
6.06	6.00	.85	6.91	7.00	3.16	--------	3.16	3.00	12.28	-------- 15.00	691 1381
*9.77	10.00	1.02	*10.79	11.00	9.99	--------	9.99	10.00	22.02	22.00 21.00 25.50	256 19 819

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	F. S. ROYSTER GUANO CO., BALTIMORE, MD., NORTHERN DIVISION.		
147	Royster's Alkaline Phosphate,	A. W. Sanat, Martin's Creek,	6.57
860	†Royster's Bumper Crop Phosphate,	H. A. Grimm, Fairchance,	7.60
111		Bastian & Romig, Wescoesville,	
1098		M. S. Stolzfus, Bellevile,	
287	†Royster's Peerless Grain and Grass Grower.	H. A. Grimm, Fairchance,	9.62
62		B. F. Gayman, Thompsontown,	
473		L. C. Blair, Rummersfield,	
463	Royster's Special Fruit and Crop Grower,	Jas. McNamara, Cadiz,	9.47
714	†Royster's Superior Potash Mixture,	Harford Grange, Harford,	10.27
1337		C. H. Dildine, Orangeville,	
	SCOTT FERTILIZER CO., ELKTON, MD.		
887	Scott's Alkaline Phosphate,	W. H. Diehl, Northumberland, R. D.	9.23
888	†Scott's Tip Top and Potash,	W. H. Diehl, Northumberland, R. D.	9.46
1468		Elias S. Brubaker, Richland,	
	SOUTHERN FERTILIZING CO., BY A. A. C. CO., N. Y.		
222	Southern Fertilizing Co.'s Special Brand for All Crops.	Wm. F. Howe, York Springs, R. D. 2.	9.27
	SWIFT & CO., CHICAGO, ILL.		
1377	†Swift's Pure Diamond H. Fertilizer,	B. W. Jones, Doe Run,	8.61
394		Lan. Co. Farmer's Asson., Manheim, R. D.	
1394		Curtis Kelley, Canton, No. 72,	
837	†Swift's Pure High Grade Phosphate and Potash.	Beaver Hdw. Co., Beaver,	7.50
1321		H. B. Low & Son, Orangeville,	
163	Swift's Pure Plantation 8 and 5,	J. R. Hummel, Bethlehem,	6.89
681	†Swift's Pure Diamond G. Fertilizer,	G. M. Englehorts, Mifflinburg, R. F. D. 6.	8.35
551		Amandus Wootring, Schnecksville,	
1395		Custis Kelley, Canton, No. 72,	
1681	†Swift's Special Phosphate and Potash,	McCalmont & Co., Bellefonte,	8.94
975		H. W. Sweiger, Gap,	
1717		A. M. McClure, Everett,	
	I. P. THOMAS & SONS CO., PHILADELPHIA, PA.		
355	†Bull's Eye Fertilizer,	Elmer Eaby, Lititz,	10.88
104		O. H. Cressman, Allentown, R. D.,	
474		F. S. Van Orman, LeRaysville,	
678	†Pilot Potash Manure,	J. K. Young, Mifflinburg,	9.21
208		John Engle, Hummelstown,	
1315		F. P. Davis, Bloomsburg,	
102	†Special Corn and Grain Fertilizer,	O. H. Cressman, Allentown, R. D.,	11.06
1067		Geo. P. Noll, Lewisburg,	
1068	†Thomas' Square Deal Fertilizer,	Geo. P. Noll, Lewisburg,	10.01
628		G. A. Haden, Flicksville, R. D. 1,	
1331		Rush Harrison, Forks,	
	JAMES THOMAS, WILLIAMSPORT, PA.		
138	†Thomas' Dissolved Alkaline Phosphate,	Coryell & Russ Co., St. Marys,	10.16
1523		McEwen Hdw. Co., New Bethlehem,	
	NASSAU FERTILIZER CO., NEW YORK CITY, N. Y.		
578	†Grass and Grain Fertilizer,	C. J. Ford, LeRaysville,	9.93
1558		A. J. La Barr, Caverton,	
588	†Royal Mixture,	Mat. Griffin, Friendsville,	8.58
1890		Kemmerer Hdw. Co., Lehighton,	

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*Constituent falls below guaranty.

FERTILIZER—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Available.			Total.				Total.				
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.			
5.82	6.00	1.64	7.46	6.50	3.77	--------	3.77	3.00	13.00	10.15	147
8.35	8.00	.89	9.24	8.50	6.79	--------	679	5.00	17.67	17.50 ------ -------	860 111 1098
*9.73	10.00	.93	10.66	10.50	3.51	--------	3.51	2.00	15.31	16.00 15.00 15.20	287 62 473
*9.56	10.00	.90	10.46	10.50	8.04	--------	8.04	8.00	19.81	18.75	463
13.46	12.00	1.11	14.57	12.50	5.02	--------	5.02	5.00	19.58	17.50 17.00	714 1337
9.93	8.00	3.14	13.07	--------	4.65	--------	*4.65	5.00	17.44	15.50	887
13.16	10.00	.36	13.52	--------	2.45	--------	2.45	2.00	16.50	19.50 15.50	888 1468
10.33	10.00	.93	11.26	11.00	5.71	--------	*5.71	6.00	18.00	17.00	222
12.07	12.00	.70	*12.77	13.00	5.07	--------	5.07	5.00	18.48	18.00 16.00 18.25	1377 394 1394
10.00	10.00	1.28	11.28	11.00	3.99	--------	3.99	4.00	16.15	17.50 15.40	837 1321
8.43	8.00	.76	9.19	9.00	5.15	--------	5.15	5.00	14.47	15.00	163
9.91	10.00	.31	10.22	11.00	7.60	--------	*7.60	8.00	19.39	20.00 19.00 22.00	681 551 1395
10.72	10.00	.16	10.88	11.00	2.11	--------	2.11	2.00	14.35	16.00 13.00 15.00	1681 975 1717
10.06	10.00	.87	10.93	11.00	7.77	--------	*7.77	8.00	19.86	19.50 18.00 17.60	355 104 474
7.95	8.00	.74	*8.69	9.00	5.23	--------	5.23	5.00	15.75	14.50 15.50 16.00	678 208 1315
10.00	10.00	.76	*10.76	11.00	6.53	--------	6.53	6.50	18.56	18.00 19.00	102 1067
8.98	9.00	.52	*9.50	10.00	3.98	--------	3.98	3.00	15.14	14.00 13.50 16.00	1068 628 1331
10.87	10.00	.17	11.04	11.00	2.38	--------	2.38	2.00	14.76	20.00 22.00	138 1523
10.23	10.00	1.42	11.65	11.00	2.32	--------	2.32	2.00	14.64	15.00 17.00	578 1558
8.37	8.00	1.13	9.50	9.00	5.30	--------	5.30	5.00	16.24	17.50 18.00	588 1890

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†Composite sample.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	F. W. TUNNELL & CO., INC., PHILADELPHIA.		
120	Gehman's Special,	W. M. Gehman, Macungie,	11.02
	TUSCARORA FERTILIZER CO., BALTIMORE, MD.		
285	Tuscarora Alkaline,	Frederick & Inks, Fairchance,	9.07
891		Frank Geist (not an agent), Northumberland, R. D.	
286	Tuscarora Potash Mixture,	Fredericks & Inks, Fairchance,	6.03
	J. E. TYGERT CO., PHILADELPHIA, P., BY A. A. C. CO., N. Y.		
1155	Soluble Phosphate and Potash,	Geo. S. Miller, Mifflinville,	12.24
	UNION CHEMICAL WORKS, NORTH WALES, PA.		
1666	†Superphosphate and Potash No. 2,	A. W. Schoener, Womelsdorf,	8.31
1783		Jesse Ziegler, Royersford,	
	UNITED STATES FERTILIZER CO., THE, MD.		
748	Farm Bell Alkaline Mixture,	S. B. Jackson, Carlisle,	9.07
234	†Farm Bell Phosphate and Potash,	J. Chester Bell, Gettysburg,	7.30
26		J. N. Getz, Lock Haven,	
443		Henry P. Brown, Laurys,	
1900	Farm Bell Ten and Five Mixture,	Wm. Ewes, Jerseytown, R. D. 1,	9.56
	VIRGINIA CAROLINA CHEMICAL CO., FOR RESALE BY RASIN MONUMENTAL CO., BALTIMORE, MD.		
692	†V. C. C. Co. Peerless Phosphate and Potash.	Isaac Kunkle, Winfield, R. F. D.,	9.01
1256		J. D. Markle, Hanover,	
619	V. C. C. Co. Union Superphosphate,	Huston Bros., Three Springs,	6.37
	FOR W. E. WHANN CO., PHILADELPHIA, PA., BY A. A. C. Co., N. Y.		
23	Whann's Alkaline Phosphate,	S. E. Schwalm, Valley View,	11.58
	ROBERT A. WOOLDRIDGE CO., BALTIMORE, MD.		
72	Wooldridge's Ideal Grain and Grass Producer.	J. G. Sully, Richfield,	8.61
742	†Wooldridge's German Potash Mixture,	S. B. Jackson, Carlisle,	10.09
455		Rufus Bohr, Snedburg,	
1053		Bennage & Dersham, White Deer,	
309	†Wooldridge's Liberty Bell Potash Mixture	F. G. Evans, Kelton,	9.14
747		S. B. Jackson, Carlisle,	
454	†Wooldridge's No. 2 Phosphate and Potash.	Rufus Bohr, Snedburg,	8.89
218		A. M. Brandt & Son, Dillsburg,	
1052		Bennage & Dersham, White Deer,	
71	†Wooldridge's Old Sledge Phosphate,	J. G. Sully, Richfield,	10.61
1966		Mock & Royer, Williamsburg,	
	YORK CHEMICAL WORKS, YORK, PA.		
1259	Dempwolf's Black Cross,	M. J. Sheffer, Hanover,	8.84
1539	†Dempwolf's Red Cross,	Leonard Rhone, Center Hall,	7.61
1229		D. E. Brandt, East Berlin,	
1709		Albert Dively, Bedford, R. F. D.,	
502	†Dempwolf's York Special,	R. L. Riegen & Son, Herndon,	7.44
211		W. H. Rapp, Union Deposit,	
1234		N. M. Berkheimer, Abbottstown,	

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†Composite sample.

FERTILIZER—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Available.			Total.				Total.				
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.			
*11.71	13.00	1.54	*13.25	14.00	8.45	--------	8.45	6.00	18.94	20.00	120
10.29	10.00	.43	10.72	10.50	5.24	--------	5.24	5.00	17.34	19.00 18.00	285 891
6.55	6.00	.53	7.08	6.50	3.19	--------	3.19	3.00	12.58	16.00	286
*9.66	10.00	1.16	10.82	11.00	3.02	--------	3.02	2.00	14.83	15.50	1155
9.93	10.00	.40	*10.33	11.00	5.05	--------	5.05	5.00	16.86	17.00 17.50	1666 1783
10.21	10.00	.92	11.13	11.00	2.28	--------	2.28	2.00	14.32	16.50	748
8.75	8.00	.20	8.95	9.00	5.37	--------	5.37	5.00	16.23	15.00 17.00 14.00	234 26 443
10.39	10.00	.37	*10.76	11.00	5.10	--------	5.10	5.00	17.23	15.00	1900
7.99	8.00	1.44	9.43	9.00	2.11	--------	2.11	2.00	12.84	------- 13.00	692 1256
*5.63	6.00	1.12	*6.75	7.00	3.04	--------	3.04	3.00	11.91	12.00	619
10.96	10.00	.77	11.73	11.00	2.13	--------	2.13	2.00	14.79	13.95	23
10.15	10.00	.75	10.90	11.00	4.65	--------	4.65	4.00	16.72	16.00	72
10.49	10.00	.83	11.32	11.00	2.13	--------	2.13	2.00	14.44	14.50 16.00 14.00	742 455 1053
12.05	12.00	.60	*12.65	13.00	3.39	--------	3.39	3.00	16.76	17.00 17.60	309 747
8.18	8.00	.87	9.05	9.00	4.97	--------	4.97	5.00	15.67	17.00 17.50 15.00	454 218 1052
12.49	12.00	.68	13.17	13.00	5.19	--------	5.19	5.00	18.92	18.00 20.00	71 1966
10.16	10.00	.51	10.67	10.50	2.58	--------	2.58	2.00	14.54	15.50	1259
10.16	10.00	.45	10.61	10.50	5.86	--------	51.86	5.00	17.84	16.25 16.00 -------	1539 1229 1709
8.80	8.00	1.25	10.05	8.50	4.63	--------	4.63	4.00	15.93	15.00 16.00 15.50	502 211 1234

*Constituent falls below guaranty.

ACIDULATED

Furnishing

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK.	
758	Acid Phosphate,	Nickless & Stewart, Shippensburg,
268	†Dissolved Phosphate,	J. A. McCombs, New Salem,
46		John Artley, Muncy,
662		Dufton Hdw. Co., Clearfield,
1442	†Bardley's Soluble Dissolved Phosphate,	Geo. R. Andrews, Enon Valley,
488		Eli Yost, McEwensville,
1943		H. G. Luker, Kittanning,
1648	†Canton Chemical Baker's Dissolved S. C. Phosphate.	Greencastle Elev., Co., Greencastle,
1972		H. L. Orr, Tyrone,
96	†Crocker's Dissolved Phosphate,	W. H. Kaufman, Harmony,
848		L. P. Amer, Orangeville, Ohio,
1697	Great East. Unammoniated Wheat Special,	J. H. Clemson, Stormstown,
1933	Maryland Dissolved S. C. Phosphate,	Smith & McKelvey, Blairsville,
1853	Michigan Carbon Works Red Line Phosphate.	Davis & Hyde, Spartansburg,
1423	Quinnipiac Soluble Dissolved Phosphate,	J. L. Culp, Indiana,
1347	Read's Acid Phosphate,	Salem Smith, Orwigsburg, R. D.,
1753	Sharpless & Carpenter's Acid Phosphate,	Henry Frankenfield, Ferndale,
838	Williams & Clark Acorn Acid Phosphate,	C. F. Thompson, Beaver Falls,
	ARMOUR FERTILIZER WORKS, BALTIMORE, MD.	
870	†Star Phosphate,	Louck's Hdw. Co., Scottdale,
1917		C. L. Shipman, Hughesville,
	ATLANTIC FERTILIZER CO., BALTIMORE, MD.	
1929	Dissolved Phosphate, 14%,	S. J. Sider, Blacklick,
	BALTIMORE FERTILIZER CO., BALTIMORE, MD.	
231	†Honest Acid Phosphate,	J. N. Lightner, Gettysburg,
614		Howard Toells, McConnellsburg,
	BAUGH & SONS CO., PHILADELPHIA, PA.	
235	†Baugh's High Grade Acid Phosphate,	H. D. and J. F. Bream, Gettysburg,
186		J. A. Romberger, Elizabethville,
271		Hogsett & Hankins, Uniontown,
464	†Baugh's 16% Acid Phosphate,	Orwell Farmers' Club, Orwell,
41		Herman Keebler, Montoursville,
617		C. E. Starr, Three Springs,
	BOWKER FERTILIZER CO., NEW YORK, N. Y.	
1192	†Bowker's Dissolved Phosphate,	Murray & Co., Honesdale,
422		A. C. McClure, Burgettstown,
1922		Frank S. Carothers, Jersey Shore,
	BUFFALO FERTILIZER CO., BUFFALO, N. Y.	
1429	†Dissolved Phosphate,	Learn Gen. Store, Indiana,
653		B. J. Crismaan, Curwensville,
1518		D. A. Wilson, Sligo.
	COE-MORTIMER CO., NEW YORK, N. Y.	
593	E. Frank Coe's High Grade Soluble Phosphate.	Wm. Dayton, Montrose,

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†Composite sample.

ROCK PHOSPHATE.

Phosphoric Acid.

Phosphoric Acid in 100 Pounds.					Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.	Moisture in 100 pounds.
Available.		Insoluble.	Total.					
Found.	Guaranteed.		Found.	Guaranteed.				
7.39	14.69	14.00	1.54	16.23	15.00	14.35	13.50	758
9.81	12.07	12.00	1.68	13.75	13.00	12.49	16.00 14.50 17.50	268 46 662
10.45	14.45	14.00	1.90	16.35	15.00	14.29	15.20 13.00 20.00	1442 488 1943
8.78	14.76	14.00	.73	15.49	15.00	14.10	13.00 14.50	1648 1972
10.66	14.56	14.00	2.12	16.68	15.00	14.47	15.00 ---------	96 848
4.66	14.17	12.00	.37	14.54	13.00	13.53	14.00	1697
8.74	14.82	14.00	2.07	16.89	15.00	14.64	16.00	1933
11.59	14.17	14.00	2.44	16.61	15.00	14.28	15.00	1853
8.62	15.15	14.00	1.94	17.09	15.00	14.82	15.00	1423
8.82	14.86	14.00	.57	15.43	15.00	14.11	15.00	1347
8.61	14.79	14.00	.56	15.35	15.00	14.06	15.00	1753
10.67	14.45	14.00	2.09	16.54	15.00	14.36	16.00	838
9.32	14.46	14.00	.61	15.07	14.50	13.82	15.00 14.00	870 1917
8.03	15.22	14.00	1.29	16.51	15.00	14.61	15.00	1929
6.33	16.51	14.00	.51	17.02	15.00	15.26	14.00 14.00	231 614
9.73	14.68	14.00	.46	15.14	-----------	13.95	14.00 13.00 14.00	235 186 271
11.82	16.55	16.00	.24	16.79	-----------	15.21	12.96 15.00 13.25	464 41 617
8.37	12.11	11.00	1.66	13.77	12.00	12.51	--------- 18.00 14.00	1192 422 1922
8.95	13.93	14.00	1.54	15.47	15.00	13.77	15.00 15.00 15.00	1429 653 1518
11.12	14.18	14.00	1.35	15.53	15.00	13.92	15.00	593

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	HENRY COPE & CO., LINCOLN UNIVERSITY, PA.	
827	Henry Cope & CO.'s Acid Phosphate,	H. A. Mendenhall, Toughkenamon,
	JAMES G. DOWNWARD CO., THE, COATESVILLE, PA.	
941	High Grade Acid Phosphate,	Michael Scott, Quarryville, R. D.,
	EUREKA FERTILIZER CO., PERRYVILLE, MD.	
615	P. and P. Superphosphate,	A. N. Witter, Waterfall,
	W. S. FARMER & CO.'S, BALTIMORE, MD.	
1738	W. S. Farmer & Co.'s Dissolved S. C. Phosphate.	P. J. Cover & Son, Meyersdale,
	GRIFFITH & BOYD CO., Baltimore, Md.	
994	High Grade Acid Phosphate,	W. C. Herr, Strasburg,
	S. M. HESS & BRO., INC., PHILADELPHIA, PA.	
605	†S. M. Hess & Bros. High Grade Acid Phosphate.	J. E. Emerick, Alum Bank,
1713		Ira Price, Everett, R. D. 6,
	HUBBARD FERTILIZER CO., BALTIMORE, MD.	
1747	Hubbard's 16% Phosphate;	S. B. Alcott, Ursina,
	LANCASTER CHEMICAL CO., LANCASCASTER, PA.	
970	†No. 8 Acid Phosphate,	I. B. Myer, Leola,
1037		L. N. Miller, Neff's Mills,
	LISTER AGRICULTURAL CHEMICAL WORKS, NEWARK, N. J.	
699	†Lister's Buyer's Choice Acid Phosphate,	Calvin Deakin, Susquehanna,
28		A. F. Wentz, Jersey Shore,
917		B. F. Walters, Christiana,
	FREDERICK MEHRING, BRUCEVILLE, MD.	
1245	Acid Phosphate,	J. N. Slifer, Littlestown,
	NASSAU FERTILIZER CO., NEW YORK.	
1030	†Soluble Phosphate,	A. J. Bowser, Mill Creek,
1015		Oscar Thompson, Conyngham,
1600		Peffer & Son, Punxsutawney,
	NITRATE AGENCY CO., NEW YORK.	
1586	Acid Phosphate,	M. T. Craig & Son, Limestone,
	G. OBER & SON'S CO., BALTIMORE, MD.	
1411	†Ober's Dissolved Phosphate,	S. J. Louther, Carroltown,
1422		J. L. Culp, Indiana,
	PIEDMONT MT. AIRY GUANO CO., BALTIMORE, MD.	
1034	†Piedmont 14% Acid Phosphate,	J. J. Simpson, Huntingdon,
1687		J. G. Dubbs, Bellefonte,

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†Composite sample.

PHOSPHATE—Continued.

Phosphoric Acid in 100 Pounds.					Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.	Moisture in 100 pounds.
Available.			Total.					
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.				
11.17	16.13	14.00	1.20	17.33	15.00	15.26	13.00	827
7.56	*13.60	14.00	1.15	*14.75	15.00	13.41	14.00	941
10.66	15.00	14.00	.94	15.94	15.00	14.35	14.00	615
6.31	14.70	14.00	1.26	15.96	15.00	14.24	18.00	1738
7.08	*12.21	14.00	3.09	15.30	15.00	13.10	14.00	994
8.91	14.35	14.00	.73	15.08	15.00	13.81	14.50 13.50	605 1713
9.03	16.17	16.00	1.02	17.19	17.00	15.22	16.00	1747
9.45	*11.28	14.00	3.55	14.83	15.00	12.62	12.50 18.00	970 1037
11.19	14.27	14.00	.93	15.20	15.00	13.81	16.00 17.00 13.00	699 28 917
7.45	17.89	15.00	.18	18.07	....	16.18	14.00	1245
10.17	15.02	14.00	1.15	16.17	15.00	14.42	14.55 15.50 17.00	1030 1015 1600
12.09	14.66	14.00	1.43	16.09	15.00	14.28	14.00	1586
8.98	14.99	14.00	.48	15.47	15.00	14.18	14.50 15.00	1411 1422
7.44	14.84	14.00	.33	15.17	....	14.02	13.00 15.00	1034 1687

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	PENNSYLVANIA FERTILIZER CO., BUFFALO, N. Y.	
1598	Acid Phosphate,	Reynoldsville Hdw. Co., Reynoldsville,
	F. S. ROYSTER GUANO CO., BALTIMORE, MD.	
526	†Royster's 14% Acid Phosphate,	Jos. Baker, Ebensburg, R. D.,
280		King Bros., Uniontown,
1496		L. K. Gruber, Reinhold,
1168	†Royster's High Grade 16% Acid Phosphate.	Bitler & John, Catawissa,
1548		R. D. Forman, Center Hall,
	SCHAAL SHELDON FERTILIZER CO., BUFFALO, N. Y.	
575	Dissolved Phosphate,	P. A. Drane, Marwood,
	JOHN T. SWACK, DU BOIS, PA.	
122	Swack's Acid Phosphate,	E. J. Flynn, Grampian,
	SWIFT & CO., CHICAGO, ILL.	
432	Swift's Pure Garden City Phosphate,	Beaver Hdw. Co., Beaver,
	JAMES THOMAS, WILLIAMSPORT, PA.	
137	†Thomas' Dissolved Florida Phosphate,	Coryell & Russ Co., St. Marys,
1522		McEwen Hdw. Co., New Bethlehem,
	UNITED STATES FERTILIZER CO., BALMORE, MD.	
1901	Farm Bell Acid Phosphate,	Wm. Eves, Jerseytown, R. D.,
	ROBERT A. WOOLDRIDGE CO., BALTIMORE, MD.	
308	†Wooldridge's Florida Acid Phosphate,	F. G. Evans, Kelton,
456		Rufus Bohr, Snedburg,

†Composite sample.

PHOSPHATE—Continued.

Phosphoric Acid in 100 Pounds.					Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.	Moisture in 100 Pounds.
Available.		Insoluble.	Total.					
Found.	Guaranteed.		Found.	Guaranteed.				
8.37	*11.07	12.00	1.35	*12.42	13.00	11.65	18.00	1598
6.03	14.46	14.00	1.01	15.47	14.50	13.96	14.00 14.50 14.00	526 280 1496
10.76	*15.58	16.00	.78	16.36	16.50	14.71	16.00 15.25	1168 1548
12.47	*13.33	14.00	2.95	16.28	15.00	13.88	16.00	575
11.44	15.72	14.00	.36	16.08	------------	14.17	13.65	122
10.71	14.19	14.00	.70	14.89	15.00	13.68	15.00	432
9.26	13.04	12.00	.36	*13.40	14.00	12.73	17.00 18.00	137 1522
10.71	16.53	14.00	.43	16.96	15.00	15.25	12.50	1901
10.37	14.72	14.00	.73	15.45	15.00	14.06	12.50 15.50	308 456

*Constituent falls below guaranty.

GROUND BONE

Furnishing Phosphoric

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK.	
506	Bone Meal,	Wallace Sherbine, Witmore,
277	†Fine Ground Bone,	King Bros., Uniontown,
133		Hall, Kaul & Hyde, St. Marys,
809		F. G. Evans, Kelton,
1948	†High Grade Ground Bone,	H. L. Stultz, Hollidaysburg,
1447		Theilman Seed Co., Erie City,
1969		H. L. Orr, Tyrone,
1211	†Pure Raw Bone,	A. A. Miller, Somerset, R. F. D. 4,
1647		Greencastle Elevator Co., Greencastle,
	R. S. AUKER, SHAMOKIN, PA.	
511	Pure Ground Bone Meal,	A. Skelly, Ebensburg,
	AMERICAN FERTILIZING CO., BALTIMORE, MD.	
908	Pure Raw Bone,	Jones Eavenson, Christiana,
	ARMOUR FERTILIZER WORKS, BALTIMORE, MD.	
523	†Bone Meal,	A. Skelly, Ebensburg,
124		Hibner Hoover Co., Du Bois,
725		Kirkpatrick Bros., Renfrew,
2028	Raw Bone Meal,	Buffalo Valley Fruit Farm, Mifflinburg,
	BAUGH & SONS CO., PHILADELPHIA, PENNA.	
298	†Baugh's Raw Bone Meal (Warranted Pure.)	Long & Bunting, Oxford,
272		Hogsett & Hankins, Uniontown,
655		Routch & Swartzel, Clearfield,
	BERG CO., THE, PHILADELPHIA, PA.	
293	Berg's Raw Bone, Fine,	B. R. Watson, Oxford,
	BOWKERFERTILIZER CO., NEW YORK.	
1110	Bowker's Fresh Ground Bone,	J. A. Stoll & Co., Kane,
	BUFFALO FERTILIZER CO., THE, BUFFALO, N. Y.	
652	†Bone Meal,	B. J. Crissman, Curwensville,
1430		Learn Gen. Store, Indiana,
	GRIFFITH & BOYD CO., BALTIMORE, MD.	
833	Pure Fine Ground Bone Meal,	W. H. Walker, Kennett Square,
902	Soft Ground Bone Meal,	E. D. Tewksbury, Catawissa, R. D. 5,
	HUBBARD FERTILIZER CO., BALTIMORE, MD.	
1307	Hubbard's Warranted Raw Bone, 4½-50,	D. J. Trout, Stewartstown,
	JARECKI CHEMICAL CO., SANDUSKY, OHIO.	
1513	Pure Ground Bone,	Clark Bros., Oil City,
	D. B. MARTIN CO., PHILADELPHIA, PA.	
396	Martin's Pure Ground Bone,	Lan. Co. Farmers' Assn., Manheim, R. D.

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†Composite sample.

FERTILIZERS.

Acid and Nitrogen.

Moisture in 100 pounds.	Mechanical Analysis.		Chemical Analysis.				Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
	Diameter less than 1-50 inch "fine."	Diameter greater than 1-50 inch "coarse."	Phosphoric Acid		Nitrogen.				
			Found.	Guaranteed.	Found.	Guaranteed.			
5.02	67	33	16.56	14.73	1.61	1.65	23.32	30.00	506
5.20	64	36	25.21	22.88	2.91	2.47	35.47	34.00 36.00 27.00	277 133 809
6.02	61	39	21.50	20.59	3.85	3.29	37.68	32.00 40.00 40.00	1948 1447 1969
10.89	64	36	22.00	21.51	3.72	3.70	37.32	29.00 32.00	1211 1647
7.81	21	79	*18.24	20.00	3.70	2.47	30.06	31.00	511
7.07	27	73	22.79	22.50	4.36	3.70	36.24	31.00	908
3.94	62	38	22.87	22.50	2.73	2.47	32.39	31.50 35.00 30.00	523 124 735
7.64	47	53	22.02	22.00	3.98	3.70	35.97	----------	2028
8.47	56	44	*20.79	21.50	3.72	3.70	34.53	27.00 34.00 32.00	298 272 655
5.04	44	56	22.57	20.00	3.53	3.00	34.35	31.00	293
8.17	76	24	22.92	22.83	2.57	2.47	33.08	32.00	1110
8.91	72	28	*21.09	22.00	2.72	2.90	31.89	30.00 32.00	652 1430
8.39	63	37	*18.57	22.00	4.49	3.30	36.48	31.00	883
5.79	68	32	18.92	11.00	2.76	2.50	26.88	26.00	902
6.44	49	51	*20.29	22.00	3.82	3.69	34.02	30.00	1307
4.60	68	32	23.21	20.00	2.98	2.50	34.57	36.00	1513
4.37	61	39	*21.68	22.90	2.74	1.65	31.81	25.00	396

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	PITTSBURG PROVISION AND PACKING CO., PITTSBURG, PA.	
724	†Pure Raw Bone Meal,	C. A. Foster, Carnegie,
1861		W. J. Gilson, Titusville,
	POLLOCK FERTILIZER CO., BALTIMORE, MD.	
1103	Soft Ground Bone,	B. J. Crissman, Curwensville,
324		Harvey Speneer, Cochraanville,
1267		Strayer Bros. Co., York,
	READING BONE FERTILIZER CO., READING, PA.	
900	Pure Raw Bone,	C. L. Pike, Catawissa, R. D. 5,
	F. S. ROYSTER GUANO CO., BALTIMORE, MD.	
528	Pure Raw Bone Meal,	Jos. Baker, Ebensburg, R. D.,
	JAMES THOMAS, WILLIAMSPORT, PA.	
136	Thomas' Animal Ground Bone,	Coryell & Russ Co., St. Marys,
	F. W. TUNNELL & CO., PHILADELPHIA, PA.	
1363	Pure Ground Bone,	Edw. Brinton & Son, West Chester,
	YORK CHEMICAL WORKS, YORK, PA.	
315	Dempwolf's Pure Ground Bone,	W. S. Hastings & Son, Atglen,

†Composite sample.

FERTILIZERS—Continued.

Moisture in 100 pounds.	Mechanical Analysis.		Chemical Analysis.				Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
			Phosphoric Acid		Nitrogen.				
	Diameter less than 1-50 inch "fine."	Diameter greater than 1-50 inch "coarse."	Found.	Guaranteed.	Found.	Guaranteed.			
3.43	65	35	21.22	21.00	3.88	3.70	36.88	31.00 29.00	724 1861
5.50	57	43	15.37	13.73	2.72	2.47	26.31	30.00 28.00 28.75	1103 324 1267
6.18	42	58	21.52	18.00	3.63	3.28	33.80	34.00	900
8.62	26	74	23.93	21.50	4.31	3.70	36.76	32.00	528
5.33	53	47	24.98	25.00	3.04	2.88	35.02	32.00	136
2.73	56	44	26.49	25.00	*1.70	2.47	31.05	32.00	1363
2.06	62	38	23.14	23.00	2.61	2.47	32.44	30.00	315

*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken
	BOWKER FERTILIZER CO., NEW YORK.	
895	Bowker's Ammoniated O. I. O. Phosphate,	W. W. Kase & Co., Riverside,
	GRIFFITH & BOYD CO., BALTIMORE, MD.	
240	Pure Dissolved Animal Bone,	H. J. Van Dyke, Gettysburg, R. D. 6,
	D. B. MARTIN CO., PHILADELPHIA, PA.	
263 6 430	†Martin's Crop Producer,	H. Cooke & Co., Dillsburg, John K. Miller, Summit Sta., A. E. Walker, Burgettstown,
	READING BONE FERTILIZER CO., READING, PA.	
254	Dissolved Animal Matter,	Grover C. Myers, Idaville,

†Composite sample.

FERTILIZERS.

Moisture in 100 pounds.	Phosphoric Acid in 100 Pounds.					Nitrogen in 100 Pounds.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
	Available.			Total.						
	Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Found.	Guaranteed.			
7.31	11.35	10.00	1.03	12.38	11.00	.85	.62	15.63	15.50	895
7.66	11.01	10.00	4.02	15.03	11.00	2.18	2.00	29.73	27.00	240
11.16	*9.53	10.00	2.39	11.92	----------	1.21	1.03	19.54	15.50 12.50 21.00	263 6 430
4.59	*9.18	10.00	2.82	12.00	11.00	.95	.82	18.86	17.00	254

*Constituent falls below guaranty.

MISCELLANEOUS

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK.		
329	†Muriate of Potash,	Wm. S. Ball, Media,	1.17
460		J. P. Griffith & Sons, Nichols, N.Y.	
459	†Nitrate of Soda,	J. P. Griffith & Son, Nichols, N. Y.	1.61
21		Philip Updegrave, Valley View,	
577		C. J. Ford, Le Raysville,	
1557	†Genuine German Kainit,	H. B. Hamid, Caverton,	1.19
743		S. B. Jackson, Carlisle,	
1827		V. L. Crandall, McClure,	
	AMERICAN FERTILIZER CO., BALTIMORE, MD.		
909	American Genuine German Kainit,	Jones Eavenson, Christiana,	1.73
910	Muriate of Potash,	Jones Eavenson, Christiana,	2.88
	ARMOUR FERTILIZER WORKS, BALTIMORE, MD.		
1916	†Kainit,	C. L. Shipman, Hughesville,	.46
1959		A. B. Mock, Martinsburg,	
	BAUGH & SONS CO., PHILADELPHIA, PA.		
465	†Nitrate of Soda,	Orwell Farmers' Club, Orwell,	1.71
531		A. F. Kimmel, Orwigsburg,	
1801	†Genuine German Kainit,	B. F. Horting, Newport,	1.12
246		Biglerville W'house Co., Biglerville,	
1868		Long & Miller, Liverpool,	
	BUFFALO FERTILIZER CO., BUFFALO, N. Y.		
654	Muriate of Potash,	B. J. Crisman, Curwensville,	.27
	COE-MORTIMER CO., NEW YORK.		
609	†Thomas' Phosphate Powder (Basic Slag Phosphate.)	A. C. Richards & Son, Schellsburg,	.09
591		Wm. Dayton, Montrose,	
1587		W. T. Craig & Son, Limestone,	
1020	Nitrate of Soda,	N. G. Williams, St. Johns,	1.84
	COLUMBIA GUANO CO., BALTIMORE, MD.		
1433	Genuine German Kainit,	A. George & Son, Homer City,	.66
	GERMAN KALI WORKS, BALTIMORE, MD.		
1588	Muriatte of Potash,	W. T. Craig & Son, Limestone,	1.12
1589	Sulphate of Potash,	W. T. Craig & Son, Limestone,	.26
	GRIFFITH & BOYD CO., BALTIMORE, MD.		
997	Genuine German Kainit,	W. O. Herr, Strasbury,	.28
	S. M. HESS & BRO., INC., PHILADELPHIA, PA.		
1715	S. M. Hess & Bro.'s Muriate of Potash,	Ira Price, Everett, R. D. 6,	1.30
	LISTER AGRICULTURAL CHEMICAL WORKS, NEWARK, N. J.		
918	Genuine German Kainit,	B. F. Walter, Christiana,	1.78
29	Lister's High Grade Dried Blood,	A. F. Wentz, Jersey Shore,	10.04
700	Nitrate of Soda,	Calvin Deakin, Susquehanna,	2.31

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†Composite sample.

FERTILIZERS.

Phosphoric Acid in 100 Pounds. Available. Found.	Phosphoric Acid in 100 Pounds. Available. Guaranteed.	Phosphoric Acid in 100 Pounds. Total. Found.	Phosphoric Acid in 100 Pounds. Total. Guaranteed.	Phosphoric Acid in 100 Pounds. Insoluble.	Potash in 100 Pounds. Present as muriate.	Potash in 100 Pounds. Present as sulphate.	Potash in 100 Pounds. Total. Found.	Potash in 100 Pounds. Total. Guaranteed.	Nitrogen in 100 lbs. Found.	Nitrogen in 100 lbs. Guaranteed.	Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
------	------	------	------	------	50.58	------	50.58	49.00	------	------	53.61	45.00	329
												50.60	460
------	------	------	------	------	------	------	------	------	16.08	15.00	65.76	52.60	459
												50.00	21
												55.00	577
------	------	------	------	------	13.06	------	13.06	12.00	------	------	15.31	14.00	1557
												------	743
												14.00	1827
------	------	------	------	------	13.62	------	13.62	12.00	------	------	15.87	12.00	909
------	------	------	------	------	48.98	------	48.98	48.00	------	------	51.98	42.00	910
------	------	------	------	------	14.38	------	14.38	12.00	------	------	16.64	14.00	1916
												13.50	1959
------	------	------	------	------	------	------	------	------	15.55	15.23	63.58	50.00	465
												50.00	531
------	------	------	------	------	14.34	------	14.34	12.00	------	------	16.64	12.25	1801
												14.00	246
												14.00	1868
------	------	------	------	------	53.40	------	53.40	48.00	------	------	56.17	46.00	654
------	------	------	18.34	17.00	------	------	------	------	------	------	------	18.40	609
												19.00	591
												18.00	1587
------	------	------	------	------	------	------	------	------	15.85	15.00	64.77	55.00	1020
------	------	------	------	------	13.98	------	13.98	12.00	------	------	16.28	14.50	1433
------	------	------	------	------	49.46	------	*49.46	50.00	------	------	52.44	43.00	1588
------	------	------	------	------	------	49.58	49.58	48.00	------	------	64.50	52.00	1589
------	------	------	------	------	15.04	------	15.04	12.00	------	------	17.35	------	997
------	------	------	------	------	47.92	------	*47.92	49.00	------	------	50.86	46.00	1715
------	------	------	------	------	12.88	------	12.88	12.00	------	------	15.16	13.00	918
------	------	------	------	------	------	------	------	------	*9.06	9.87	43.27	56.00	29
------	------	------	------	------	------	------	------	------	15.90	15.00	64.96	55.00	700

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*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	NITRATE AGENCIES CO., NEW YORK.		
390	Muriate of Potash,	Lan. Co. Farmers' Assn., Manheim,	.32
949	Dried Blood,	S. M. Book & Bro., Peters Creek, R. D.	15.86
950	Ground Tankage,	S. M. Book & Bro., Peters Creek, R. D.	8.01
1585	Nitrate of Soda,	W. T. Craig & Son, Limestone,	2.03
	PIEDMONT MT. AIRY GUANO CO., BALMORE, MD.		
1036	Sulphate of Potash,	Jno. G. Simpson, Huntingdon,	.72
1690	Muriate of Potash,	Jno. G. Dubbs, Bellefonte,	.26
	PITTSBURG PROVISION AND PACKING CO., PITTSBURG, PA.		
266	Pure Bone and Meat,	Weddle & Sutton, West Newton,	11.02
	READING BONE FERTILIZER CO., READING, PA.		
289	Nitrate of Soda,	Reading Bone Fert. Co., Reading,	.64
290	Muriate of Potash,	Reading Bone Fert. Co., Reading,	.54
	RASIN MONUMENTAL CO., BALTIMORE, MD.		
320	†Muriate of Potash,	E. H. Keen & Co., Parksburg,	2.89
1552		Chas. McCormick, State College,	
	F. S. ROYSTER GUANO CO., BALTIMORE, MD.		
1497	Genuine German Kainit,	L. K. Gruber, Reinhold,	1.34
1664	Muriate of Potash,	Chas. Geiger, Scarlett Mills,	1.06
1665	Nitrate of Soda,	Chas. Geiger, Scarlett Mills,	1.94
	JOHN F. SWACK, DU BOIS, PA.		
672	Nitrate of Soda,	E. J. Flynn, Grampian,	1.34
	SWIFT & CO., CHICAGO, ILL.		
1716	Swift's Pure German Kainit,	A. M. McClure, Everett,	1.06
	I. P. THOMAS & SON'S CO., PHILADELPHIA, PA.		
478	Nitrate of Soda,	F. L. Van Orman, LeRaysville,	1.98
477	Top Dresser for Grass,	F. L. Van Orman, LeRaysville,	6.94
	UNION CHEMICAL WORKS, NORTH WALES, PA.		
16	Nitrate of Soda,	Frank Dietrick, Friedensburg,	2.41
	UNITED STATES FERTILIZER CO., BALTIMORE, MD.		
228	Kainit—12,	J. Chester Bell, Gettysburg, R. D. 12.	1.09

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†Composite sample.

FERTILIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 lbs.		Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.	Sample number.
Available.		Total.					Total.						
Found.	Guaranteed.	Found.	Guaranteed.	Insoluble.	Present as sulphate.	Present as muriate.	Found.	Guaranteed.	Found.	Guaranteed.			
------	------	------	------	------	50.54	------	50.54	50.00	------	------	53.56	42.50	390
------	------	------	------	------	------	------	------	------	*12.43	13.18	51.31	63.40	949
------	------	------	*11.50	13.73	------	------	------	------	*5.51	5.75	24.98	32.00	950
------	------	------	------	------	------	------	------	------	16.00	15.00	65.36	52.00	1585
------	------	------	------	------	------	51.64	51.64	48.00	------	------	67.08	50.00	1036
------	------	------	------	------	52.28	------	52.28	50.00	------	------	55.05	------	1690
------	------	------	8.13	8.00	------	------	------	------	6.86	4.93	41.58	30.00	266
------	------	------	------	------	------	------	------	------	16.00	14.50	65.36	50.00	289
------	------	------	------	------	50.44	------	50.44	50.00	------	------	53.46	42.00	290
------	------	------	------	------	48.86	------	48.86	48.00	------	------	51.82	42.00	320
------	------	------	------	------	13.02	------	13.02	12.00	------	------	15.26	14.00	1497
------	------	------	------	------	45.86	------	*45.86	49.00	------	------	48.76	46.00	1664
------	------	------	------	------	------	------	------	------	15.45	15.00	63.18	54.00	1665
------	------	------	------	------	------	------	------	------	16.00	15.00	65.36	50.00	672
------	------	------	------	------	12.16	------	*12.16	12.40	------	------	14.40	15.00	1716
------	------	------	------	------	------	------	------	------	15.88	15.25	64.96	52.00	478
------	------	------	------	------	3.20	5.42	8.62	5.00	*7.12	9.00	55.02	46.00	477
------	------	------	------	------	------	------	------	------	15.80	15.50	64.57	------	16
------	------	------	------	------	13.08	------	13.08	12.00	------	------	15.37	14.00	228

*Constituent falls below guaranty.

Commonwealth of Pennsylvania.

DEPARTMENT OF AGRICULTURE

BULLETIN No. 231

A Partial List of Owners and Breeders of Registered Live-Stock in Pennsylvania with an Appendix Showing the Pure-Bred Stallion Registration for the years 1910-1911

HARRISBURG:
C. E. AUGHINBAUGH, PRINTER TO THE STATE OF PENNSYLVANIA
1912

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PREFACE.

The advantage in favor of raising pure-bred stock is coming to be understood more and more as the years go by, and the mission of this bulletin is to encourage and help stock-breeders in the efforts they are making along this line.

Frequent inquiries come to this department in regard to the probable cost of pure-bred sires and the places at which they may be obtained at the least cost for transportation.

The purpose of this bulletin is to place such information in the hands of Pennsylvania breeders, and especially to inform them where they can get what they want without going outside of their own state. It will bring the owners of pure-bred stock into touch with each other and enable them to arrange for the exchange and transfer of such animals as they may need without being obliged to pay the large freight bills that result from making shipments from distant points.

It is also intended to assist, where breeders have doubt concerning the correctness of the claims made by owners of registered animals as to the ancestry of the same, by making it possible to communicate directly with the Association that keeps the Record.

The information here given was secured through the assistance and co-operation of Pedigreed-Stock Record Associations, Agricultural Societies and Fair Associations, to all of whom this Department wishes to acknowledge its obligation for the help so cheerfully rendered.

It is not claimed that the list of pedigreed-stock given is complete, but the Department endeavored to make it as nearly so as possible by communicating with every person who was reported as the owner of such stock, requesting him to make an individual report of his herds, giving in every instance the name of the Record Association with which his stock is registered.

In the investigations made it was found that there is a large number of animals in the state, of pedigreed ancestry, unregistered, that are eligible to registration, but none such are given in the list, the purpose being to include such animals only as are recorded in the respective herd books of the breeds to which they belong.

The matter of the bulletin has been so arranged that any particular breed of animals can be readily referred to, the name of the Record Association, together with the name and address of the Secretary of the same, being given at the head of each list.

We publish as an appendix to this bulletin a complete list of Pure-Bred Stallions, licensed in Pennsylvania for the year 1910-11, taken from the Stallion Registration Report of Dr. Carl W. Gay, Director of Horse Breeding.

N. B. CRITCHFIELD,
Secretary of Agriculture.

ARABIAN HORSES.

(Registry Association).

THE ARABIAN HORSE CLUB OF AMERICA.

H. K. Brush-Brown, *Secretary*, 1729 G. Street, N. W., Washington, D. C.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
Herman Hoopes,	West Chester,	Chester,	2			2
Henry Singer,	Gap,	Lancaster,	1			1
Totals,			3	0	0	3

BELGIAN DRAFT HORSES.

(Registry Association).

AMERICAN ASSOCIATION OF BREEDERS AND IMPORTERS OF BELGIAN DRAFT HORSES.

J. D. Conner, Jr., *Secretary*, Wabash, Ind.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
W. H. Baldridge,	Latrobe,	Westmoreland,	4	4		8
J. M. Barkley,	Bakersville,	Somerset,	1	3		4
Canton Tile Hollow Brick Company.	New Bethlehem,	Clarion,	1	2	4	7
Thomas Cooper,	East Brook,	Lawrence,	3	1		4
C. E. Cummings,	Strattonville,	Clarion,	1			1
D. Wellington Dietrich,	Reading,	Berks,		3		3
S. L. Egbert,	Sandy Lake,	Mercer,	1			1
D. L. Frazee,	Washington,	Washington,	2	5		7
C. J. Gamble & Son,	Transfer No. 50,	Mercer,	1	3		4
W. L. Gerheart,	Donegal,	Westmoreland,	1			1
Lyman Hunter,	Hartstown,	Crawford,	1	3		4
C. H. Jennings,	Towanda,	Bradford,	1	2		3
J. P. C. King,	Summerville,	Jefferson,		3		3
W. H. King,	Lawsonham,	Clarion,	3	3		6
Anselm B. Kirsch,	Nicktown,	Cambria,	1	3		4
F. A. Klock,	Wellsboro, R. D.,	Tioga,	1	1		2
J. C. McKinney,	Titusville,	Crawford,	1	8		9
McClellan Miller,	Frogtown,	Clarion,	1			1
Oliver Morrison,	Greensboro No. 1,	Greene,		4		4
C. F. Mount,	Koppel,	Beaver,		1		1
C. F. Polliard,	New Bethlehem,	Clarion,		3		3
E. E. Polliard,	Lawsonham No. 1,	Clarion,	1	2		3
W. L. Porter,	Jamestown,	Mercer,		1		1
Jos. B. Twining,	Gettysburg,	Adams,	3	19		22
Totals,			28	74	4	106

CLEVELAND BAY HORSES.

(Registry Association).

CLEVELAND BAY SOCIETY OF AMERICA.

R. P. Stericker, *Secretary*, Aurora, Ill.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
H. Spedding,	Clifford,	Susquehanna,		1	----	1

CLYDESDALE HORSES.

(Registry Association).

AMERICAN CLYDESDALE ASSOCIATION.

R. B. Ogilvie, *Secretary*, 842 Exchange Ave., Chicago, Ill.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
Conyngham Bros.,	Wilkes-Barre,	Luzerne,	1	11	----	12
S. L. Egbert,	Sandy Lake,	Mercer,	1	2	----	3
J. J. Fontz,	Mercer No. 3,	Mercer,	----	1	----	1
U. G. Sterrett,	Jackson Center,	Mercer,	2	1	----	3
Totals,			4	15	0	19

FRENCH COACH HORSES.

(Registry Associations).

FRENCH COACH HORSE SOCIETY OF AMERICA.

Duncan E. Willet, *Secretary*, Oak Park, Ill.

FRENCH COACH HORSE REGISTER CO.

T. E. McLaughlin, *Secretary*, Columbus, O.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
C. N. Shaffer,	Overton,	Bradford,	1	1	----	2

FRENCH DRAFT HORSES.

(Registry Association).

NATIONAL FRENCH DRAFT HORSE ASSOCIATION.

C. E. Stubbs, *Secretary*, Fairfield, Iowa.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
Geo. Fulmer,	Shelocta,	Indiana,	----	1	----	1
Geo. R. Kinnan,	Elkin,	Indiana,	1	1	----	2
J. E. Kissinger,	Gettysburg,	Adams,	1	----	----	1
John Knierman,	Conneaut Lake,	Crawford,	----	2	----	2
Ed. Nicodemus,	Waynesboro,	Franklin,	3	5	----	8
Geo. Ommert,	Mercersburg,	Franklin,	1	----	----	1
S. J. Stahlman,	Brookville No. 6,	Jefferson,	1	----	----	1
Totals,			7	9	0	16

GERMAN COACH HORSES.

(Registry Association).

GERMAN, HANOVERIAN AND OLDENBURG COACH HORSE ASSOCIATION OF AMERICA.

J. Crouch, *Secretary*, LaFayette, Ind.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
Wm. C. Bloss and Jas. W. Loy.	New Tripoli,	Lehigh,	1	----	----	1
Geo. B. Mellor, Jr.,	West Chester,	Chester,	1	----	----	1
Totals,			2	0	0	2

HACKNEY HORSES.

(Registry Association).

AMERICAN HACKNEY HORSE SOCIETY.

Gurney C. Gue, *Secretary*, Hempstead, N. Y.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
Wm. L. Austin,	Rosemont,	Montgomery,	1	2	----	3
Francis E. Bond,	Gwynedd Valley,	Montgomery,	----	6	6	12
E. B. Cassatt,	Berwyn,	Chester,	----	3	----	3
G. H. Clamer,	Philadelphia,	Philadelphia,	----	1	1	2
Alfred Clements,	New Centreville,	Chester,	5	14	1	20
John W. Converse,	Rosemont,	Delaware,	----	2	----	2
J. N. Conyngham,	Wilkes-Barre,	Luzerne,	----	1	1	2
Chas. R. Hamilton,	Devon,	Chester,	1	----	----	1
W. D. Henry,	Sewickley,	Allegheny,	14	25	4	43
Harry D. Halloway,	Philadelphia,	Philadelphia,	1	4	2	7
Mrs. J. Kearsley Mitchell,	Rosemont,	Montgomery,	----	1	----	1
Isaac Norris,	Bryn Mawr,	Montgomery,	5	19	----	24
Amos Tobias,	Ono,	Lebanon,	----	1	----	1
Thos. Turnbull, Jr.,	Pittsburgh,	Allegheny,	3	4	----	7
Edward W. Twaddell,	Westtown,	Chester,	2	9	----	11
Chas. Z. Weiss,	Avon,	Lebanon,	----	----	1	1
Totals,			32	92	16	140

MORGAN HORSES.

(Registry Association).

AMERICAN MORGAN REGISTRY ASSOCIATION.

Thos. E. Boyce, *Secretary*, Middlebury, Vt.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
Barnes & McElbrath,	Jackson Centre,	Mercer,	1	1	----	2
N. M. Beach,	Mansfield No. 3,	Tioga,	2	3	----	5
F. V. Frisbie,	Wysox,	Bradford,	2	6	----	8
A. R. Van Tassel,	DuBois,	Clearfield,	3	8	2	13
D. M. Young,	Milan,	Bradford,	----	----	1	1
Totals,			8	18	3	29

PERCHERON HORSES.

(Registry Associations).

PERCHERON SOCIETY OF AMERICA.

Wayne Dinsmore, *Secretary*, Union Stock Yards, Chicago, Ill.

THE AMERICAN BREEDERS AND IMPORTERS PERCHERON REGISTRY COMPANY.

Jno. A. Forney, *Secretary*, Plainfield, O.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
C. H. Andrew,	Deer Lick,	Greene,	3	6	----	9
G. M. Baker,	Carrolltown No. 1,	Cambria,	2	1	----	3
W. H. Baldridge,	Latrobe,	Westmoreland,	2	3	----	5
Wm. S. Baltz,	Newtown Square,	Delaware,	----	3	----	3
W. C. Begley,	Somerset,	Somerset,	----	3	----	3
Guy Blakeslee,	Spartansburg,	Crawford,	1	----	----	1
H. E. Bollard,	Linesville,	Crawford,	----	3	----	3
Logan L. Bond,	Brockwayville No. 1,	Jefferson,	7	14	----	21
John C. Bowman,	Meshoppen,	Wyoming,	1	----	----	1
J. G. and H. A. Boyle,	Canonsburg,	Washington,	1	3	----	4
Bradford Percheron Horse Co.	Bradford,	McKean,	1	----	----	1
Jas. S. Buchanan & Son,	Hickory,	Washington,	2	4	----	6
John W. Burket,	Tyrone,	Blair,	1	2	----	3

PERCHERON HORSES—Continued.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
J. M. Burton,	East Brook No. 1,	Lawrence,	1	1	----	2
F. E. Cleveland,	Smethport,	McKean,	1	1	----	2
Jas. M. Colegrove,	Corry No. 1,	Erie,	1	4	----	5
N. B. Critchfield,	Stoyestown No. 1,	Somerset,	1	----	----	1
Geo. W. Deeds,	Ligonier,	Westmoreland,	2	5	3	10
Mrs. Arthur W. Dennison,	Akeley No. 2,	Warren,	2	----	----	2
A. M. Dickson,	Sandy Lake No. 27,	Mercer,	2	2	----	4
D. Wellington Dietrich,	Reading,	Berks,	----	10	----	10
Harry L. Eichar,	Greensburg No. 5,	Westmoreland,	----	2	----	2
S. L. Egbert,	Sandy Lake,	Mercer,	2	2	----	4
Eldred Percheron Horse Co.	Eldred,	McKean,	1	----	----	1
Geo. W. Elkins, Jr.,	Abington,	Montgomery,	1	----	----	1
J. H. Emhoff,	New Bethlehem,	Clarion,	1	----	----	1
E. J. Ferrell,	West Alexander,	Washington,	1	----	----	1
D. L. Frazee,	Washington,	Washington,	1	----	----	1
John Free,	Conneaut Lake,	Crawford,	3	8	----	11
W. L. Fullerton,	Moravia,	Lawrence,	----	1	----	1
Geo. Greer,	New Castle,	Lawrence,	1	5	1	7
S. A. Griffin,	Sabinsville,	Tioga,	1	----	----	1
C. F. Hahn,	Meshoppen,	Wyoming,	----	2	----	2
Fred Hall,	Baxter,	Jefferson,	1	----	----	1
Wm. Frazier Harrison,	Oreland,	Montgomery,	----	8	----	8
C. F. Henry,	New Bethlehem No. 1,	Clarion,	1	----	----	1
John F. Hice,	Wilmore No. 2,	Cambria,	1	----	----	1
H. A. Himebaugh,	Saegerstown,	Crawford,	----	3	----	3
Norvin C. Holmes,	Leolyn,	Tioga,	1	----	----	1
Lyman Hunter,	Hartstown,	Crawford,	1	1	----	2
T. E. Hyde,	Bloomsburg,	Columbia,	1	5	----	6
J. N. Ifft,	Evans City,	Butler,	4	4	----	8
Alta Jackson,	Linesville,	Crawford,	----	2	1	3
Cortez H. Jennings,	Towanda,	Bradford,	2	2	----	4
James M. Johnston,	Mercersburg No. 4,	Franklin,	1	3	----	4
Robert Johnston,	Canonsburg No. 3,	Washington,	1	2	----	3
Geo. R. Kinnan,	Elkin,	Indiana,	----	3	----	3
Jas. H. Lauer,	Marble,	Clarion,	1	----	----	1
A. L. Lindsey,	Washington No. 6,	Washington,	----	2	----	2
Little Missouri Horse Co.,	Meadville,	Crawford,	6	28	2	36
R. W. Lohr,	Boswell No. 1,	Somerset,	1	----	----	1
E. R. Loy,	Loysville,	Perry,	----	4	----	4
Loysville Percheron Horse Co.	Loysville,	Perry,	1	----	----	1
J. H. McClure,	New Wilmington,	Lawrence,	1	1	----	2
Vance C. McCormick,	Harrisburg,	Dauphin,	2	4	----	6
F. W. and W. A. McCoy & Sons.	Mercer,	Mercer,	3	8	----	11
W. A. McCoy & Sons,	Mercer,	Mercer,	3	8	----	11
J. C. McKinney,	Titusville,	Crawford,	1	6	----	7
F. R. McMahon,	Altoona No. 1,	Blair,	----	1	----	1
McMillen & Anderson,	West Middlesex,	Mercer,	1	----	----	1
David Marsh,	Centerville,	Crawford,	----	2	----	2
C. D. Marshall,	Pottstown,	Chester,	----	3	----	3
J. B. Martin,	Greencastle,	Franklin,	1	----	----	1
W. C. Maxwell,	Derrick City,	McKean,	----	2	----	2
W. J. Merkle,	Allentown No. 2,	Lehigh,	1	3	----	4
J. Wildon Moninger,	Washington No. 4,	Washington,	1	----	----	1
C. F. Mount,	Koppel,	Beaver,	----	4	----	4
Elias Neese,	Dora,	Jefferson,	1	1	----	2
C. P. Nevell,	Mills Run,	Fayette,	1	----	----	1
Jas. P. Nichols,	Murdocksville No. 1,	Washington,	1	----	----	1
Ed. Nicodemus,	Waynesboro,	Franklin,	2	3	----	5
Wm. Paden,	Greenville,	Mercer,	2	10	----	12
Geo. G. Paxton,	Houston,	Washington,	1	3	----	4
Nelson Poorbaugh,	Mt. Pleasant,	Westmoreland,	----	1	----	1
Port Allegany Horse Association.	Port Allegany,	McKean,	1	----	----	1
Post Bros.,	West Alexander No. 2,	Washington,	----	3	----	3
P. F. Ray,	West Sunbury,	Butler,	1	5	----	6
Richard E. Reitz,	Brookville,	Jefferson,	1	----	----	1
G. H. Reynolds,	Alba,	Bradford,	6	14	----	20
H. P. Reynolds,	Aitch,	Huntingdon,	5	11	----	16
J. S. Rhodes,	Kennard,	Mercer,	1	1	----	2
Geo. Richards,	Smethport,	McKean,	----	1	----	1
Edw. H. Scholl,	Allentown No. 2,	Lehigh,	----	2	----	2

PERCHERON HORSES—Continued.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
Lee R. Scott,	Burgettstown,	Washington,	----	2	----	2
J. C. Shaffer,	Dayton,	Indiana,	2	2	----	4
Andrew Shellito,	Shadeland,	Crawford,	1	2	----	3
H. S. Shields,	Linesville,	Crawford,	3	4	----	7
L. L. Shreve,	Spartansburg,	Crawford,	1	1	----	2
A. Skelly,	Ebensburg,	Cambria,	2	2	----	4
L. O. Slayton,	Conneautville,	Crawford,	----	2	----	2
Thos. E. Smedley,	Anselma,	Chester,	1	1	----	2
J. M. Smith,	Greenville,	Mercer,	----	4	----	4
G. E. Smith,	Mercer,	Mercer,	2	----	----	2
Wm. F. Smith,	Greenville No. 45,	Mercer,	----	6	----	6
H. M. Snider,	Hadley,	Mercer,	1	2	----	3
P. H. Sopher,	Jackson Center No. 18,	Mercer,	1	----	----	1
H. F. Stark,	Greensburg,	Westmoreland,	1	2	----	3
Sterrett Bros.,	Brockwayville,	Jefferson,	3	3	----	6
Geo. E. Stevenson & Sons,	Waverly,	Lackawanna,	1	----	----	1
D. G. Stufft,	Stoyestown,	Somerset,	1	2	----	3
J. B. W. Stufft,	Ralphton,	Somerset,	----	2	----	2
John H. Supplee,	Rosemont,	Montgomery,	----	1	----	1
J. Howard Supplee,	Rosemont,	Montgomery,	1	----	----	1
Frank Terry,	Linesville,	Crawford,	----	2	----	2
A. C. Urey,	Sandy Lake,	Mercer,	----	1	----	1
Jos. Vickers,	Mansfield,	Tioga,	1	----	----	1
O. N. Wilson,	Kittanning,	Armstrong,	16	39	----	55
A. N. Womelsdorf,	Mill Hall, R. D.,	Clinton,	----	3	----	3
Totals,			141	332	7	480

SADDLE HORSES.

(Registry Association).

AMERICAN SADDLE HORSE BREEDERS' ASSOCIATION.

R. H. Lillard, *Secretary*, Louisville, Ky.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
W. H. Baldridge,	Latrobe,	Westmoreland,	1	----	----	1
Edward W. Twaddell,	Westtown,	Chester,	3	----	----	3
Totals,			4	0	0	4

SHIRE HORSES.

(Registry Association).

AMERICAN SHIRE HORSE ASSOCIATION.

Chas. Burgess, *Secretary*, Wenona, Ill.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
L. L. Bodine,	Franklin No. 2,	Venango,	----	1	1	2
F. E. Cleveland,	Smethport,	McKean,	1	----	----	1
Geo. W. Deeds,	Ligonier,	Westmoreland,	----	1	1	2
Geo. A. Hogg,	Pittsburgh,	Allegheny,	3	8	4	15
William Hudson,	Latrobe No. 3,	Westmoreland,	2	5	1	8
Eaton Tartor King,	Philadelphia,	Philadelphia,	1	----	----	1
J. C. McConnaughey,	Ligonier,	Westmoreland,	----	3	3	6
J. S. McLaughlin,	Leechburg,	Armstrong,	----	3	----	3
E. G. Mitchell,	Waterford,	Erie,	3	2	----	5
G. W. Pearson,	Jackson Center,	Mercer,	6	3	----	9
W. W. Pool & Son,	Stoneboro,	Mercer,	----	1	----	1
Andrew Shellito,	Shadeland,	Crawford,	1	1	----	2
H. F. Stark,	Greensburg,	Westmoreland,	----	2	----	2
James Steele,	Greensburg No. 4,	Westmoreland,	1	7	----	8
R. H. Thompson,	Home No. 1,	Indiana,	1	2	----	3
R. M. Waldron,	Greensburg,	Westmoreland,	1	----	----	1
Totals,			20	39	10	69

SUFFOLK HORSES.

(Registry Association).

AMERICAN SUFFOLK HORSE ASSOCIATION.

A. Graham Galbraith, Secretary, DeKalb, Ill.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
Conyngham Bros.,	Wilkes-Barre,	Luzerne,	1	2	----	3

THOROUGHBRED HORSES.

(Registry Association).

THE JOCKEY CLUB.

W. H. Rowe, *Registrar*, 6 and 8 E. 46th St., New York.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
H. Morris Adams,	Hatboro,	Montgomery,		3		3
Wm. D. Althouse,	Phoenixville,	Chester,	1	5	2	8
Geo. W. J. Bissell,	Pittsburgh,	Allegheny,	1	8	1	10
E. B. Cassatt,	Berwyn,	Chester,	3	23	9	35
Jos. Casson,	Radnor,	Delaware,		1		1
Alfred Clements,	New Centerville,	Chester,			3	3
Brochwicz de Donimirski,	New London,	Chester,	1	1		2
Patrick Gallagher,	Philadelphia,	Philadelphia,	1	3		4
John R. Hawkins,	Pittsburgh,	Allegheny,	1	1		2
Warren R. Jaquett,	Wayne,	Delaware,		1		1
J. Howard Lewis,	Elkins Park,	Montgomery,	4	10	4	18
Malcolm MacFarlan, Jr.,	Lansdale,	Montgomery,		4		4
Chas. E. Mather,	West Chester No. 6,	Chester,	2	13	11	26
John K. Mitchell,	West Chester,	Chester,		2		2
Robert W. Neilson,	Cheyney,	Delaware,		1	3	4
R. Brognard Okie,	Devon,	Chester,		1		1
Samuel D. Riddle,	Glen Riddle,	Delaware,		4	6	10
David B. Sharp,	Berwyn,	Chester,	1			1
W. Hinkle Smith,	Bryn Mawr,	Montgomery,		6	3	9
R. E. Tucker,	Devon,	Chester,	1	3	3	7
Totals,			16	90	45	151

TROTTING HORSES.

(Registry Association).

AMERICAN TROTTING REGISTER ASSOCIATION.

W. H. Knight, *Secretary*, 137 S. Ashland Ave., Chicago, Ill.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
S. Alfred,	Murdocksville,	Washington,	2	2		4
W. H. Baldridge,	Latrobe,	Westmoreland,	1			1
A. H. Balliet,	Allentown,	Lehigh,	2	1		3
W. H. Barlett,	Kane,	McKean,	1			1
E. F. Brimmer,	Burgettstown No. 2,	Washington,		1		1
E. Kirk Brown,	Nottingham No. 2,	Chester,	1	3		4
Lester W. Brown,	Lewisburg,	Union,	1			1
E. A. Bubb,	Seven Valley,	York,		1		1

TROTTING HORSES—Continued.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
Peter B. Cowan,	Brookville,	Jefferson,		1		1
Geo. Dibert,	Bedford No. 1,	Bedford,	2	4		6
S. L. Egbert,	Sandy Lake,	Mercer,	1			1
Geo. W. Elkins, Jr.,	Abington,	Montgomery,	2	8		10
D. L. Frazee,	Washington,	Washington,	1			1
Lowell Gable,	Wyebrooke,	Chester,	2	3		5
L. D. M. Hatton,	Cochranville,	Chester,	1			1
J. S. Hettes,	Hop Bottom,	Susquehanna,		1		1
J. M. Hutchison,	Elkview,	Chester,		4	1	5
J. H. Lear,	Newville,	Cumberland,		1		1
David Mackey,	Oxford,	Chester.	1			1
David Mellander,	Smithton,	Westmoreland,		1		1
Geo. B. Mellor, Jr.,	West Chester,	Chester,	1	1		2
Murray A. Miller,	Milton No. 3,	Northumberland,		1		1
W. Harry Orr,	Reading,	Berks,	2	18		20
John Rick,	Reading,	Berks,		1		1
C. J. Roberts,	Hop Bottom,	Susquehanna,		1		1
H. D. Sheppard,	Hanover,	York,	1	1		2
C. K. Sober,	Lewisburg,	Union,	2	3		5
A. E. Snyder,	New Milford,	Susquehanna,		2		2
J. W. Stewart,	Jefferson,	Greene,	1	1		2
Frank Strang,	Westfield,	Tioga,	1	2		3
Edward W. Twaddell,	Westtown,	Chester,	1			1
R. M. Waldron,	Greensburg,	Westmoreland,	2	2		4
J. W. Zeller,	Lewisburg,	Union,	1	2	3	6
Totals,			30	66	4	100

ASSES.

(Registry Association).

AMERICAN BREEDERS' ASSOCIATION OF JACKS AND JENNETS.

J. W. Jones, *Secretary*, Columbia, Tenn.

NAME.	ADDRESS.	COUNTY.	Jacks.	Jennets.	Total.
McMiller & Anderson,	West Middlesex,	Mercer,	1		1
Edward W. Twaddell,	Westtown,	Chester,	1		1
Totals,			2		2

SHETLAND PONIES.

(Registry Association).

AMERICAN SHETLAND PONY CLUB.

J. M. Wade, *Secretary*, LaFayette, Ind.

NAME.	ADDRESS.	COUNTY.	Stallions.	Mares.	Geldings.	Total.
Lewis Berkebile,	Johnstown,	Cambria,	9	19	4	32
Carlisle Shetland Pony Farm.	Carlisle,	Cumberland,	3	14	----	17
Geo. Corson,	Plymouth Meeting,	Montgomery,	2	9	----	11
L. W. Gray,	Uniontown,	Fayette,	4	8	----	12
S. M. Hazlett,	Allensville,	Mifflin,	1	2	----	3
Charles F. Jenkins,	Buck Hill Falls,	Monroe,	3	11	----	14
Charles S. Jenkins,	Lansdale,	Montgomery,	5	15	----	20
C. E. Renick,	Albion,	Erie,	1	2	----	3
Wm. F. Smith,	Greenville,	Mercer,	----	3	----	3
Tucker & Westbrook,	Knoxville,	Tioga,	3	30	10	43
Totals,			31	113	14	158

ABERDEEN-ANGUS CATTLE.

(Registry Association).

AMERICAN ABERDEEN-ANGUS BREEDERS' ASSOCIATION.

Chas. Gray, *Secretary*, Chicago, Ill.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Bayard Brothers,	Waynesburg,	Greene,	3	3	17	6	29
A. J. Beall,	Davistown,	Greene,	1	1	3	1	6
Geo. Black,	Dayton,	Armstrong,	1	2	5	2	10
James Blair,	Hartstown,	Crawford,	4	10	25	6	45
J. Patrick Donley,	Carmichaels,	Greene,	1	-----	3	1	5
H. L. Haines,	Canonsburg,	Washington,	1	-----	3	-----	4
Guy G. Hope,	New Wilmington,	Lawrence,	1	4	15	4	24
L. Hunter & Son,	Hartstown,	Crawford,	1	-----	6	4	11
Lyman Hunter,	Hartstown,	Crawford,	1	1	15	3	20
Clayton Miller,	Creekside,	Indiana,	1	-----	3	-----	4
Oliver Morrison,	Greensboro No. 1,	Greene,	1	-----	7	-----	8
Penn'a State College,	State College,	Centre,	1	-----	16	-----	17
Robinson Stock Co.,	Meadville,	Crawford,	2	4	10	4	20
A. G. Sheller,	Claysville,	Washington,	1	-----	-----	-----	1
C. L. Taggart,	Washington No. 1,	Washington,	1	6	19	9	35
W. H. Wirsing,	Acme,	Westmoreland,	1	5	10	2	18
Totals,			22	36	157	42	257

AYRSHIRE CATTLE.

(Registry Association).

AYRSHIRE BREEDERS' ASSOCIATION.

C. M. Winslow, *Secretary*, Brandon, Vt.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. J. Beeker,	Chase,	Luzerne,	1	-----	4	-----	5
O. P. Blakeslee,	Spartansburg,	Crawford,	4	3	19	-----	26
Bonnymeads Farms,	Harrisburg,	Dauphin,	1	-----	8	-----	9
J. C. Boyd,	Guy's Mills,	Crawford,	1	-----	4	-----	5
J. C. Breneman,	Smethport,	McKean,	1	-----	1	-----	2
Christopher Byrne,	Friendsville,	Susquehanna,	1	1	18	2	22
P. Byrne & Sons,	St. Joseph,	Susquehanna,	1	1	30	5	37
N. A. Canficld,	Williamsport,	Lycoming,	1	-----	6	-----	7
Robert M. Carrons,	Washington,	Washington,	-----	-----	1	-----	1
C. H. Chamberiin,	Kingsley,	Susquehanna,	2	1	7	-----	10
W. J. Church,	Roulette No. 1,	Potter,	1	-----	1	-----	2
John Cleland Estate,	Scranton,	Laekawanna,	1	-----	18	2	21
I. Roberts Comfort,	West Chester,	Chester,	1	-----	3	-----	4
Edward Parker Davis,	Newtown,	Bueks,	2	-----	8	3	13
Jas. Dcubler & Sons,	Springville No. 1,	Susquehanna,	2	2	26	8	38
G. A. Dick,	Kane,	McKean,	1	-----	7	3	11
Dixmont Hospital,	Dixmont,	Allegheny,	1	-----	5	2	8
Eastern Penn'a State Institution of the Feeble-Minded and Epileptic.	Spring City No. 1,	Chester,	1	-----	3	-----	4
A. W. Eno,	Honesdale No. 1,	Wayne,	1	-----	7	-----	8
Edgar T. Fink,	Allentown No. 5,	Lehigh,	2	-----	10	-----	12
T. M. Flocker,	Beaver No. 2,	Beaver,	-----	-----	1	-----	1
E. F. Foster,	New Milford No. 3,	Susquehanna,	1	-----	4	-----	5
Friends' Asylum,	Frankford, Phila.,	Philadelphia,	5	4	65	21	95
C. A. Griscom,	Gladwyne,	Montgomery,	2	3	27	8	40
Wm. Frazier Harrison,	Orcland,	Montgomery,	1	5	10	4	20
W. H. Hartwick,	Coudersport,	Potter,	1	-----	6	4	11
Geo. T. Hatherill,	Wellsboro No. 1,	Tioga,	-----	-----	2	-----	2
Giles C. Hauber,	North Bingham,	Potter,	1	-----	8	-----	9
R. L. Holbert,	Ulysses, R. D.,	Potter,	-----	1	7	2	10
Willis W. Hopkins,	Aldenville,	Wayne,	2	-----	16	2	20
W. B. Horton,	Hatfield No. 2,	Montgomery,	1	-----	3	1	5
Elmer C. Jennings,	Mt. Bethel No. 2,	Northampton,	1	-----	4	3	8
O. A. Kibbe & Sons,	North Bingham,	Potter,	1	1	4	4	10
C. F. McCray & Son,	Corry No. 3,	Eric,	-----	-----	11	-----	11
Harry G. Miller,	Potter Brook,	Tioga,	1	-----	2	-----	3
J. F. Monroe,	Troy No. 64,	Bradford,	2	-----	8	2	12
Wm. J. Moore,	Analomink,	Monroe,	1	-----	-----	-----	1
Arthur E. Newbold, Jr.,	Laverock, Chest. Hill,	Montgomery,	1	-----	6	2	9
C. A. Page,	Wattsburg No. 3,	Erie,	-----	-----	3	-----	3
Chas. A. Palmer,	Franklin Forks,	Susquehanna,	1	1	5	-----	7
Penshurst Farm,	Narberth,	Montgomery,	2	6	48	15	71
Isaac A. Pennypaeker,	Phoenixville,	Chester,	2	-----	17	1	20
Walter H. Reburn,	Oxford No. 3,	Chester,	2	1	7	-----	10
Geo. Richards,	Smethport,	McKean,	1	1	6	3	11
L. H. Ross,	Lewisburg,	Union,	1	-----	1	-----	2
B. Luther Shimer,	Bethlehem,	Lehigh,	1	-----	7	-----	8
John Simpson,	Ariel,	Wayne,	3	-----	37	7	47
State Asylum for the Chronic Insane of Pennsylvania.	Wernersville,	Berks,	1	-----	-----	-----	1
State Livestock Sanitary Board Farm.	Media,	Delaware,	2	-----	23	-----	25
Benj. P. Stubbs,	Delta,	York,	1	-----	-----	-----	1

AYRSHIRE CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Robert Templeton & Son,	Ulster,	Bradford,	1	2	19	-----	22
W. F. Throop,	Espyville Station,	Crawford,	2	1	4	3	10
L. L. Torpy,	Wellsboro No. 4,	Tioga,	1	-----	2	-----	3
John R. Valentine,	Bryn Mawr,	Delaware,	4	3	97	71	175
R. M. White,	Fisher,	Clarion,	1	-----	-----	-----	1
H. M. Wood,	Wellsboro No. 1,	Tioga,	1	-----	1	-----	2
Frank S. Worden,	Canton No. 71,	Bradford,	1	-----	1	-----	2
Totals,			75	37	648	178	938

BROWN SWISS CATTLE.

(Registry Association).

BROWN SWISS CATTLE BREEDERS' ASSOCIATION.

Ira Inman, *Secretary*, Beloit, Wis.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
G. M. Baker,	Carrolltown No. 1,	Cambria,	1	-----	-----	-----	1
Richard Beaston,	Tyrone,	Blair,	-----	1	-----	-----	1
G. Eugene Bown,	Forksville No. 2,	Sullivan,	2	7	13	2	24
R. S. Christy,	Monongahela No. 1,	Washington,	1	-----	1	1	3
J. M. Delozier,	Hollidaysburg,	Blair,	1	-----	8	1	1[illegible]
Samuel G. Dixon,	Bryn Mawr,	Montgomery,	2	-----	16	8	26
Geo. F. Espy,	Birmingham,	Blair,	-----	-----	1	-----	1
Blair B. Hileman,	Altoona,	Blair,	2	1	14	2	19
G. J. Jelliff,	Gillett No. 56,	Bradford,	1	-----	2	-----	3
O. W. McDonald,	Cochran Mills,	Armstrong,	1	-----	1	-----	2
T. H. McDunn,	Wilmore,	Cambria,	1	-----	2	-----	3
C. D. Marshall,	Pottstown,	Chester,	4	-----	45	2	51
Jas. Masters,	Weister,	Westmoreland,	-----	-----	2	-----	2
J. U. Morgan,	Wheelerville No. 1,	Sullivan,	-----	-----	1	-----	1
John Rick,	Reading,	Berks,	1	-----	-----	-----	1
C. M. Robinson,	Meadville,	Crawford,	1	5	12	5	23
Geo. K. Robinson,	Yardley,	Bucks,	1	-----	-----	-----	1
Guy H. Smith,	Hollidaysburg No. 2,	Blair,	1	-----	6	-----	[illegible]
J. F. Wincholt,	Seven Valleys,	York,	1	-----	-----	-----	1
John S. Wohlwend,	Salina,	Westmoreland,	1	2	9	2	14
Totals,			22	16	133	23	194

DEVON CATTLE.

(Registry Association).

AMERICAN DEVON CATTLE CLUB.

L. P. Sisson, *Secretary*, Harvey, Ill.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Banker Bros.,	Franklin Forks,	Susquehanna,	1		19	4	24
Wm. H. Barto,	Hughesville,	Lycoming,	2		1		3
Wm. A. Bonar,	Coon Island,	Washington,	1		19		20
J. Cheston Morris,	West Chester No. 6,	Chester,	4	2	18		24
Powell Bros.,	Shadeland,	Crawford,	3	3	16	3	25
W. L. Wiard,	Springboro,	Crawford,	1		5	1	[illegible]
Totals,			12	5	78	8	10[illegible]

DUTCH BELTED CATTLE.

(Registry Association).

DUTCH BELTED CATTLE ASSOCIATION OF AMERICA

G. G. Gibbs, *Secretary*, Marksboro, N. J.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Mrs. W. J. Coffman,	Apollo,	Armstrong,	1		1		2
F. G. Fritz,	Valencia No. 26,	Butler,	1				1
Abel J. Haney,	Tannersville,	Monroe,	1		1		2
Bert Harris,	Linesville,	Crawford,		1	2	1	[illegible]
T. C. Howe,	Genesee,	Potter,	1				1
J. H. & G. A. Magee,	Portersville No. 83,	Butler,	1				1
J. Fred Young,	Ellwood City,	Lawrence,	1		2		[illegible]
Totals,			6	1	6	1	1[illegible]

GUERNSEY CATTLE.

(Registry Association).

THE AMERICAN GUERNSEY CATTLE CLUB.

Wm. H. Caldwell, *Secretary*, Peterboro, N. H.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
A. W. Anderson,	Kane,	McKean,	1		1		2
S. W. Applegate,	Elizabeth,	Allegheny,	1		3	2	6
Caroline Archer,	Reading,	Berks,	1	2	14	4	21
A. B. Armstrong,	Smethport,	McKean,	1	1	1		3
Ellis B. Barker,	Media No. 2,	Delaware,	1		3	2	6
Barnett Bros.,	Canonsburg No. 2,	Washington,	1			2	3
Chas. Biddle,	Andalusia,	Bucks,	1	1	6	1	9
J. E. Bird,	Dushore,	Sullivan,	1	1	4	1	7
J. F. Bogert,	Rohrsburg,	Columbia,	1		4	1	6
F. E. Bond,	Spring House,	Montgomery,	2		8	1	11
J. W. Bowman,	Rohrsburg,	Columbia,			3		3
James Boyd Est.,	Harrisburg No. 1,	Dauphin,	1		10	2	13
John F. Boyd,	West Newton,	Westmoreland,	1		8	1	10
W. S. Boyd,	Wyalusing No. 39,	Bradford,		1	3		4
Edwin K. Bready,	Chalfont,	Bucks,	2		13	3	18
Jacob W. Breneman,	Willow Street,	Lancaster,	1		3		4
J. H. Brightbill,	Marysville,	Perry,	1	1	3	1	6
Joseph Bringhurst,	West Chester,	Chester,	2				2
J. H. Brinton,	Gap,	Lancaster,	1		5	2	8
Eugene Brodhead,	Delaware Water Gap,	Monroe,	1	1	2		4
J. Horace Broomall,	Cheyney,	Delaware,			1		1
E. Kirk Brown,	Nottingham,	Chester,		1		1	2
Amos Bryan,	Perkasie,	Bucks,	1		3	2	6
H. C. Bughman,	Greensburg,	Westmoreland,				1	1
C. G. Bullers,	Brookville No. 6,	Jefferson,	1		11	1	13
Frank Burlington,	Camptown,	Bradford,	1	2	6	1	10
C. A. Burnham,	Eldred,	McKean,				1	1
Geo. Burnham,	Eldred,	McKean,	1				1
Frank Butler & Son,	Knoxville,	Tioga,	2		1		3
James Campbell,	Kane, Box 363,	McKean,	1		2	1	4
O. S. Campbell,	Mt. Pleasant No. 1,	Westmoreland,	1	1	4	2	8
Fred W. Card,	Sylvania,	Bradford,	1		5		6
Geo. M. Carpenter,	Wilkes-Barre,	Luzerne,	2	1	17	6	26
E. B. Cassatt,	Berwyn,	Chester,	2	5	38	12	57
Geo. A. Chamberlain,	Harford,	Susquehanna,	1				1
Lee S. Clymer,	Riegelsville,	Bucks,	3	1	33	8	45
H. W. Comfort,	Falisington,	Bucks,	2	1	6	1	10
John W. Cooper,	Pineville,	Bucks,	1	1	6	5	13
S. F. Cooper,	Venetia,	Washington,	1		4		5
John F. Craig,	Sligo,	Clarion,	1		4	2	7
A. J. Cullen,	Elkview,	Chester,	1	4	22	7	34
Geo. E. Deming,	Corry No. 1,	Erie,	1	1	2	1	5
Geo. Dennee,	Union City,	Erie,	1				1
M. G. Dewey,	Meadville,	Crawford,	2		3	1	6
C. H. Dildine,	Orangeville,	Columbia,	1	1	3		5
B. F. Dock,	Winfield,	Union,	1		1		2
Brochwicz de Donimirski,	New London,	Chester,			2	1	3
O. L. Dungan,	Transfer No. 51,	Mercer,	1		5	1	7
L. L. Fassett,	Laceyville No. 5,	Wyoming,	1	1	2		4
R. H. Ferguson,	Oxford No. 5,	Chester,	1		4	1	6
James Logan Fisher,	Olney, Phila.,	Philadelphia,	3	4	22	4	33
Wm. Flinn,	Pittsburgh,	Allegheny,	1	2	10	2	15
E. C. Freeman,	Cornwall,	Lebanon,	1		30		31
C. A. Freshcorn,	Zelienople No. 40,	Butler,	1	2	12	7	22
Edwin B. Freshcorn,	Zelienople,	Butler,			3	2	5

GUERNSEY CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. Clarence Fretz,	Perkasie No. 2,	Bucks,	2	1	1	-----	4
Wm. F. Fretz,	Pipersville,	Bucks,	2	-----	29	9	40
Friends' Asylum,	Frankford,	Philadelphia,	1	-----	10	3	14
T. R. Fries,	West Newton,	Westmoreland,	-----	-----	3	-----	3
Wm. F. Gable,	Wyebrooke,	Chester,	3	1	42	36	82
B. F. Gabler & Son,	Greensboro No. 1,	Greene,	1	3	13	3	20
C. W. Gilbert,	Guy's Mills,	Crawford,	1	-----	-----	-----	1
J. N. Glover,	Vicksburg,	Union,	1	-----	-----	-----	1
Grant H. Goehring,	Fombell,	Beaver,	1	-----	10	2	13
E. A. Goodlin,	Greensburg No. 1,	Westmoreland,	1	-----	3	2	6
Ira W. Grass,	Perkasie No. 4,	Bucks,	1	-----	-----	1	2
J. A. Gregg,	Butler,	Butler,	1	-----	5	2	8
H. L. Griffith,	Canonsburg No. 2,	Washington,	-----	-----	3	-----	3
G. A. Griscom,	Haverford,	Montgomery,	1	3	15	5	24
Chas. A. Groff,	Creamery,	Montgomery,	1	1	4	2	8
J. W. Grute,	Cochranton No. 66,	Crawford,	2	2	2	-----	6
Hanover Stock Farm,	Hunlock's Creek,	Luzerne,	1	1	6	-----	8
Samuel H. Harman,	Bloomsburg,	Columbia,	1	1	15	-----	17
G. J. Hartley,	Pittsfield,	Warren,	-----	-----	2	5	7
R. S. Hartley,	Pittsfield No. 1,	Warren,	3	3	11	5	22
J. R. Hay & Son,	Auburn Four Corners,	Susquehanna,	1	1	10	3	15
C. A. Hayden,	Elizabeth,	Allegheny,	2	1	7	7	17
L. E. Helsel,	Elton,	Cambria,	1	1	10	1	13
J. I. Hereter,	Gettysburg,	Adams,	1	1	2	-----	4
Samuel Hertzler,	Ronks No. 1,	Lancaster,	6	2	1	-----	9
Belmer D. Hitchcock,	Akeley No. 2,	Warren,	1	-----	1	-----	2
W. W. Hixon,	Finleyville No. 2,	Washington,	-----	-----	1	1	2
A. M. Hodgson,	New London,	Chester,	1	-----	1	-----	2
Thos. M. Hodgson,	Elk View,	Chester,	2	-----	3	6	11
M. M. & E. J. Hollingsworth.	Landenberg,	Chester,	1	7	4	30	42
Mrs. Geo. E. Holton,	Catasauqua,	Lehigh,	1	2	14	7	24
R. J. Howell,	Elizabeth No. 1,	Allegheny,	-----	-----	1	-----	1
Wm. W. Huriey,	New Hope,	Bucks,	1	1	18	6	26
T. E. Hyde,	Bloomsburg,	Columbia,	4	5	53	22	84
C. E. Ingersoll,	Pennllyn,	Montgomery,	1	1	4	1	7
G. L. Jones,	West Chester No. 5,	Chester,	4	-----	-----	-----	4
Harry A. Jones & Bro.,	Beallsville No. 1,	Washington,	1	1	2	2	6
Harry L. Jones,	Union City,	Erie,	1	-----	3	2	6
Thos. D. Jones,	Uniondale No. 4,	Susquehanna,	1	-----	3	2	6
Geo. B. R. Kennedy,	Baxter,	Jefferson,	1	-----	3	-----	4
Jos. G. Kennel,	Atglen,	Chester,	1	-----	2	-----	3
Jos. M. Kerr,	Stroudsburg,	Monroe,	1	1	15	4	21
Uzal Kinney,	Rush,	Susquehanna,	1	-----	2	-----	3
Irvin P. Knipe,	Norristown,	Montgomery,	-----	2	2	-----	4
David B. Lady,	Arendtsville,	Adams,	1	-----	10	-----	11
John W. Little,	Hanover,	York,	3	2	21	4	30
Albert N. Long,	Greensburg No. 5,	Westmoreland,	1	1	7	1	10
J. Ed. Long,	Monongahela,	Allegheny,	1	-----	4	1	6
W. E. Long,	Greensburg No. 1,	Westmoreland,	-----	-----	1	-----	1
Ira McJunkin,	Butler,	Butler,	1	-----	3	3	7
J. G. & J. A. McSparran,	Furniss,	Lancaster,	1	2	7	1	11
Sterling Macheli,	Dallas,	Luzerne,	1	-----	1	-----	2
C. D. Marshall,	Pottstown,	Chester,	1	3	18	4	26
Geo. B. Mauser,	Treichlers,	Northampton,	1	-----	-----	-----	1
R. L. Mellon,	New Brighton No. 1,	Beaver,	1	-----	3	-----	4
Frank Mensch,	Bloomsburg,	Columbia,	-----	-----	1	-----	1
Ezra Michener,	Lumberville No. 1,	Bucks,	1	-----	2	1	4
McClellan Miller,	Frogtown,	Clarion,	1	-----	-----	1	2
Wm. Miller,	West Newton,	Westmoreland,	1	2	6	6	15
F. E. Moore,	Alford,	Susquehanna,	3	1	7	1	12
M. A. Moore,	Mt. Joy,	Lancaster,	-----	-----	3	-----	3
Effingham B. Morris,	Ardmore,	Montgomery,	2	-----	17	-----	19
Maud W. Murphy,	Wawa,	Delaware,	-----	-----	2	2	4
S. I. Murphy,	Wawa,	Delaware,	1	1	2	2	6
James M. Neill,	Canonsburg,	Washington,	1	-----	4	1	6
John B. Nicholls,	Blythedale,	Allegheny,	-----	-----	1	-----	1

GUERNSEY CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
S. R. Nissley,	Manheim No. 2,	Lancaster,	1		4	2	7
Nixon Bros.,	Butler,	Butler,	2	4	12	6	24
Wm. Norris,	Conshohocken,	Montgomery,			2	1	3
J. B. Ogden,	Clearfield,	Clearfield,	1		1	1	3
Geo. W. Ott,	Doylestown,	Bucks,	6	1	60	27	94
Wm. H. Parks,	Hickory Grove,	Susquehanna,	1		4	1	6
Wm. W. Parshall,	Uniontown,	Fayette,	1	2	7	1	11
F. M. Paxton,	Washington No. 10,	Washington,			1		1
Geo. G. Paxton,	Houston,	Washington,		1	10	1	12
A. F. Peairs,	Elizabeth,	Allegheny,	1		17	1	19
Penna. State College,	State College,	Centre,	2	2	8	1	13
Peterson & Johnson,	Kane No. 1,	McKean,			2		2
H. J. Phillippi,	Ligonier No. 3,	Westmoreland,	1		1	1	3
Frederick Phillips,	Villa Nova,	Montgomery,	5	6	99	30	140
M. T. Phillips,	Pomeroy,	Chester,	3	4	34	8	49
V. E. Pierson,	Rushboro,	Susquehanna,	1		1	1	3
Chas. B. Plummer,	Wilmore No. 2,	Cambria,	2		7		9
Robert H. Pollock, Jr.,	Parkers Landing,	Armstrong,	1		6	3	10
Nelson Poorbaugh,	Mt. Pleasant,	Westmoreland,	2	1	4	1	8
Fred Taylor Pusey,	Lima,	Delaware,	1	1	7		9
Edwin Ramsay,	Evans City No. 33,	Butler,	1				1
Frank M. Reed,	Wilson,	Allegheny,			1		1
John Reefer,	Zelienople No. 40,	Butler,	1		6	2	9
Howard Reiber,	Butler,	Butler,		1	2		3
D. P. Rettew,	Coatesville,	Chester,	2		4		6
J. W. Rice,	Harmonsburg,	Crawford,	1		3		4
W. H. Ridge,	Trevose,	Bucks,	1		1	1	3
D. E. Risinger,	Homer City,	Indiana,			5		5
Arthur Roberts,	Gettysburg No. 5,	Adams,			1		1
T. W. & I. W. Roberts,	Bala,	Montgomery,	1	3	34	13	51
N. J. Rohrer,	Strasburg No. 2,	Lancaster,	1	1	8	2	12
Oliver P. Rose,	Mechanics Valley,	Bucks,	1	2	6	2	11
James M. Rowan,	Butler No. 8,	Butler,			3	1	4
S. E. Ruckle,	Mifflinville,	Columbia,	1		6		7
A. J. Ruth,	Smithton No. 1,	Westmoreland,	2		4	1	7
Harry W. Seamans,	Factoryville No. 2,	Wyoming,	1		2		3
Jas. B. Secrist,	West Newton,	Westmoreland,	1		9	2	12
G. W. Shaffer,	Greensburg,	Westmoreland,	2		2		4
J. Elizabeth Shaffer,	Etters No. 2,	York,	2		8	3	13
R. F. Shannon,	Edgeworth Station,	Allegheny,	1	1	4		6
F. H. Sheffer,	East Point,	Tioga,	1	1			2
Harry B. Shenk,	Manheim No. 1,	Lancaster,	1	3	11	3	18
A. J. Shook,	Spring Mills,	Centre,			1	1	2
Shook Bros.,	Spring Mills,	Centre,	3	4	17	1	25
Harrison W. Shuey,	Lebanon No. 10,	Lebanon,	2		1		3
Harvey W. Shuey,	Lebanon No. 3,	Lebanon,	1		6	2	9
Amos A. Slack,	Oxford,	Chester,	1	1	3	1	6
C. Morton Smith,	Philadelphia,	Philadelphia,	1	1	10	9	21
Fred E. Smith,	Steelton,	Dauphin,	2	1	6	4	13
G. Smith & Sons, Inc.,	Seelyville,	Wayne,		1	1		2
Horace T. Smith,	Buckmanville,	Bucks,	2		4	1	7
H. H. Snavely,	Willow Street,	Lancaster,	1	1	7		9
A. J. Snyder,	Plumsteadville,	Bucks,	3		12	10	25
N. D. Snyder,	Laceyville,	Wyoming,	1		9		10
J. C. Sonda & Sons,	West Alexander No. 4,	Washington,	2	1	5	1	9
S. J. Stahlman,	Brookville No. 6,	Jefferson,	1				1
State Livestock Sanitary Board Farm.	Media,	Delaware,			5		5
W. S. Stevenson,	Hookstown,	Beaver,	1		4		5
F. T. Stewart,	Washington No. 10,	Washington,	1		5	1	7
S. P. Sutor,	Scottdale,	Westmoreland,	1		3		4
G. B. Tallman,	West Grove,	Chester,	1	3	61	19	84
J. P. Tarr,	Elizabeth,	Allegheny,	1		2	2	5
J. V. Thompson,	Point Marion,	Fayette,			6		6
Wm. T. Thorp,	Grampian,	Clearfield,	1	1	5	1	8
Henry Tippery,	Callensburg,	Clarion,	2		2		4
S. W. Townsend,	Cochranville,	Chester,	1	1	5	2	9
E. S. Tupper,	Stevensville,	Bradford,	1		2	2	5

GUERNSEY CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
E. W. Twaddell,	Westtown,	Chester,	1		4	2	7
J. A. Vail,	Rea,	Washington,	1	2	2		5
W. W. Vandwort,	Callery,	Butler,		1	7	1	9
B. F. VanFleet,	Dalton,	Lackawanna,	1		2		3
Mary M. Vaux,	Bryn Mawr,	Montgomery,	1	5	50	8	64
Edw. H. Wagner,	Academy Corners,	Tioga,	1				1
Jas. D. Wall,	Grampian No. 2,	Clearfield,	1		5		6
A. H. Waterman,	North East No. 5,	Erie,			2		2
Wawa Dairy Farms,	Wawa,	Delaware,	5	5	39	6	55
R. J. Weld,	Sugar Grove,	Warren,	1		2	1	4
I. Irwin Wells,	Spring City,	Chester,	1		10	1	12
Whitford Farm,	Whitford,	Chester,	3		12	3	18
R. F. Whitmer,	Hatboro No. 1,	Montgomery,	4	5	24	3	36
J. L. Williams,	Berwick No. 3,	Columbia,	1		2		3
W. W. Wilmarth & Sons,	Kingsley,	Susquehanna,	1		3	2	6
David Wilson,	New Centreville,	Chester,	3	1	7	2	13
Theodore M. Wilson,	Frankford, Phila.,	Philadelphia,			2		2
Richard G. Wood,	Conshohocken,	Montgomery,	2	2	7	2	13
F. M. Woodmansee,	Lake Como,	Wayne,	1	1	4	2	8
C. A. Wright,	Canton No. 71,	Bradford,	1		4	5	10
H. G. Wright,	Canton No. 72,	Bradford,		1	3	1	5
C. W. Yost,	Stillwater,	Columbia,		1	3	1	5
Samuel Yost,	Stillwater,	Columbia,	1	2	7	2	12
D. C. Young,	Smethport,	McKean,	1				1
Totals,			251	165	1603	506	2525

HEREFORD CATTLE.

(Registry Association).

AMERICAN HEREFORD CATTLE BREEDERS' ASSOCIATION.

R. J. Kinzer, *Secretary*. Kansas City, Mo.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
W. C. Begley,	Somerset,	Somerset,		2	3	1	6
G. W. Carroll & Sons,	Jackson Center,	Mercer,	1	6	17	6	30
H. L. Countryman,	Berlin,	Somerset,	2		3		5
E. E. Grase,	Jackson Center No. 19.	Mercer,	1	1	5	1	8
C. M. Hostings,	Marion Center,	Indiana,	1		1		2
R. J. McCready,	Pittsburgh,	Allegheny,	1		5		6
S. O. Minor,	Carmichaels No. 1,	Greene,			2		2
M. C. Williamson,	Mapeltown, Box 26,	Greene,			2		2
Totals,			6	9	38	8	61

HOLSTEIN FRIESIAN CATTLE.

(Registry Association).

THE HOLSTEIN FRIESIAN ASSOCIATION OF AMERICA.

F. L. Houghton, *Secretary*. Brattleboro, Vt.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
F. A. Ackley,	Westfield,	Tioga,	1	1	11	1	14
G. R. Ackley,	Sabinsville,	Tioga,	1	1	9	4	15
J. E. Adamson,	Rea,	Washington,			1	2	3
Abram Adsit,	Conneaut Lake,	Crawford,	1		3	1	5
E. G. Ainey,	Hop Bottom,	Susquehanna,	1	1	14	8	24
G. O. Akam,	Corry No. 1,	Erie,	1		3	1	5

HOLSTEIN FRIESIAN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. H. Alcorn,	Waterford,	Erie,			2		2
Allegheny County Home,	Woodville,	Allegheny,	1		16		17
E. D. Allen,	Harford, Box 15,	Susquehanna,	1	1	11	4	17
Ivan Allen,	Wellsboro,	Tioga,		2	3		5
J. L. Allen,	Columbia X Roads,	Bradford,			10		10
Frank R. Allis,	Wysox,	Bradford,	1		5	2	8
G. G. Allis,	Rummerfield,	Bradford,	1		3		4
James Arnold,	Elk Lake,	Susquehanna,	1		5	2	8
Willard Arnold,	Granville Summit, 69,	Bradford,	1	1	2	1	5
S. S. Artman,	Greenville,	Mercer,		1	1		2
John B. Ault,	Linden,	Lycoming,	1		9	2	12
Jasper M. Austin,	Akeley,	Warren,	1				1
W. T. Austin,	Alderson,	Luzerne,	1	1	2		4
Frank S. Avery,	Tunkhannock No. 1,	Wyoming,	1		8	3	12
E. V. Babcock,	Pittsburgh,	Allegheny,	1	2	19	6	28
Dana S. Bacon,	Wellsboro No. 10,	Tioga,	1	1	3	1	6
H. H. Bailey,	LaPlume,	Lackawanna,	1		6		7
Geo. W. Baldwin,	Doe Run,	Chester,	2	2	4		8
L. H. Ball,	Montrose,	Susquehanna,		1	3		4
Wm. S. Baltz,	Newtown Square,	Delaware,	1		14	3	18
W. L. Barnhart,	Llewellyn,	Schuylkill,	1	1	2	1	5
H. S. Bartoo,	Harrison Valley,	Potter,	1		4		5
H. E. Bates,	Jamestown,	Mercer,	1				1
John Bauer,	Emporium,	Cameron,	3		6	2	11
R. V. Beaman,	Wellsboro No. 4,	Tioga,	1	1	2		4
C. M. Bean,	Conneautville,	Crawford,	1	3	11	1	16
H. A. Beattie,	Shippensburg,	Cumberland,		1	1		2
Jas. S. Beaver,	Millerstown,	Perry,	1		2		3
G. A. Belknap,	Conneautville,	Crawford,	1		6	2	9
W. S. Beltzhoover,	East Greenville,	Bucks,	1		5	3	9
Farris E. Bennett,	Montrose,	Susquehanna,	1		4	2	7
W. M. Benninger,	Walnutport,	Northampton,	10	4	12	6	32
Harry Bernauer,	Wellsboro No. 6,	Tioga,		1	1		2
F. E. Bertholf,	Montrose No. 4,	Susquehanna,				1	1
Wm. H. Bickerton,	Speers,	Washington,			1		1
M. L. Blackwell,	Damascus,	Wayne,	1		3		4
A. O. Blake,	Bethany,	Wayne,			1		1
Chas. O. Blake,	Honesdale,	Wayne,	1		12	3	16
Bloom Bros.,	Elton,	Cambria,	1		2	1	4
J. D. Bloomhardt,	Altoona,	Blair,	1				1
J. C. Bonnell,	Waterford,	Erie,	1				1
Bonnymeads Farms,	Harrisburg No. 1,	Dauphin,	7	11	65	13	96
A. L. Bowell,	Thompson No. 1,	Susquehanna,	1		3	1	5
E. T. Bowen,	Spring Brook,	Lackawanna,	1		5		6
R. W. Bowen,	Wellsboro,	Tioga,			4		4
Fred D. Bradford,	Columbia X Roads,	Bradford,	1		9	1	11
L. J. Bradford,	Columbia X Roads No. 61.	Tioga,	1		6		7
Elmer W. Breed,	Kingsley,	Susquehanna,	2		8	2	12
S. Fitch Breed,	Kingsley,	Susquehanna,	2		9	3	14
J. C. Brittain,	New Galilee,	Beaver,	1		1		2
Arthur Brooks,	Wellsboro No. 5,	Tioga,	1		5		6
D. M. Brown,	Elkland,	Tioga,	1		6	1	8
H. S. Brown,	Thompson,	Susquehanna,	1		6		7
L. L. Brown,	Jamestown,	Mercer,			7	7	14
H. S. Buchanan,	Hickory,	Washington,	1		5	1	7
Wm. Bulford,	Dallas,	Luzerne,			8		8
Bruce B. Bunnell,	Montrose No. 1,	Susquehanna,			3		3
B. S. Bunnell,	Factoryville No. 1,	Wyoming,	1				1
John M. Bunnell,	Montrose,	Susquehanna,	1				1
J. W. Bunnell,	Montrose No. 1,	Susquehanna,	1	2	11	3	17
W. Scott Bunting,	Oxford No. 5,	Chester,	1		14	1	16
Abraham Burdick,	Springville,	Susquehanna,			2		2
Anthony Burke,	Honesdale No. 3,	Wayne,	1		5	3	9
L. C. Burroughs,	Burlington,	Bradford,	1		1		2
Art S. Burt,	Ulysses,	Potter,	1		3		4
R. L. Bush,	Montrose,	Susquehanna,			2		2
Mrs. E. H. Byers,	Sharon,	Mercer,	1	1	3	3	8

HOLSTEIN FRIESIAN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
R. S. Caldwell,	McDonald No. 4,	Washington,	3	-----	6	-----	9
Cheyney J. Calhoun,	Wellsboro,	Tioga,	1	1	15	-----	17
Campbell Bros.,	Linden,	Lycoming,	1	-----	2	-----	3
Richard C. Carlson,	Port Allegany,	McKean,	-----	-----	1	-----	1
A. B. Carpenter,	Wellsboro,	Tioga,	1	-----	-----	-----	1
Geo. M. Carpenter,	Wilkes-Barre,	Luzerne,	1	3	47	14	65
R. L. Carter,	Hickory,	Washington,	2	2	21	10	35
W. E. Caum,	Haverford,	Delaware,	2	-----	15	2	19
E. A. Chapman,	Espyville Station,	Crawford,	1	-----	2	-----	3
Chester Co. Home,	Embreeville,	Chester,	4	4	17	4	29
The Children's Village,	Meadowbrook,	Montgomery,	1	1	2	-----	4
David M. Clark,	Richland Centre No. 2,	Bucks,	1	-----	12	2	15
R. P. Clark,	Spring Creek No. 7,	Warren,	1	-----	4	-----	5
F. W. Cleaver,	Beallsville,	Washington,	1	-----	4	3	8
W. W. Cleveland,	Canoe Camp,	Tioga,	-----	2	6	3	11
Benj. Z. Cobb,	New Milford,	Susquehanna,	1	-----	4	-----	5
G. B. Cobb,	Ulysses,	Potter,	-----	1	5	1	7
J. B. Colcord,	Port Allegany,	McKean,	1	-----	8	4	13
Edgar Collins,	Espyville,	Crawford,	-----	-----	1	-----	1
Thos. F. Collins,	Greenville,	Mercer,	1	-----	16	-----	17
J. N. Conyngham,	Wilkes-Barre,	Luzerne,	7	4	72	13	96
Lewis Copp,	Rutland,	Tioga,	1	1	3	1	6
C. C. Corbett,	Corsica,	Jefferson,	-----	-----	2	1	3
Geo. F. Courtney,	Mercer No. 6,	Mercer,	-----	1	5	1	7
N. J. Crees,	New Galilee,	Beaver,	-----	-----	3	-----	3
S. S. Creese,	New Galilee,	Beaver,	-----	-----	1	-----	1
Frank Cronk,	Montrose No. 4,	Susquehanna,	1	-----	-----	-----	1
W. P. Crumling,	High Rock,	York,	1	2	13	5	21
W. C. Cruser,	Montrose,	Susquehanna,	2	1	29	6	38
Walter M. Cruttenden,	Mansfield,	Tioga,	2	-----	21	-----	23
Henry Daly,	Montrose No. 4,	Susquehanna,	1	-----	3	1	5
H. F. Daniels,	Knoxville No. 2,	Tioga,	-----	-----	2	-----	2
D. H. Darby,	Hoytville,	Tioga,	1	-----	3	3	7
A. P. Davis,	Westfield,	Tioga,	1	-----	8	-----	9
Sidney S. Davis,	Seven Valleys,	York,	5	2	10	3	20
T. R. Davis,	Wellsboro,	Tioga,	-----	-----	2	-----	2
W. B. Dearth,	Uniontown,	Fayette,	1	-----	1	-----	2
Aaron Decker,	Mehoopany,	Wyoming,	-----	-----	1	-----	1
A. F. Decker,	Dalton No. 3,	Lackawanna,	1	-----	5	1	7
G. Fulmer Decker,	South Montrose,	Susquehanna,	1	1	12	5	19
Mrs. Hattie A. Decker,	Westfield,	Tioga,	2	-----	7	1	10
H. R. Decker,	South Montrose,	Susquehanna,	1	-----	10	4	15
Albert Deming,	Lawrenceville,	Tioga,	1	-----	3	-----	4
J. B. Dennis,	Eldred,	McKean,	1	-----	2	-----	3
William B. Devaney,	Berwyn,	Chester,	1	3	7	2	13
D. Wellington Dietrich,	Reading,	Berks,	2	4	10	5	21
John Dingfelder,	Corry No. 1,	Erie,	1	-----	3	-----	4
C. A. Dorsey,	West Brownsville,	Washington,	1	-----	6	4	11
B. C. Dotterer,	Mill Hall, R. D.,	Clinton,	-----	1	-----	-----	1
J. Havard Downing,	E. Downingtown,	Chester,	1	-----	-----	-----	1
Lewis R. Downing,	E. Downingtown,	Chester,	-----	-----	4	-----	4
E. W. Downton,	Starrucca,	Wayne,	-----	-----	1	-----	1
P. H. Doyle,	Greenville,	Mercer,	1	1	5	1	8
Fred L. Drake,	Shingle House,	Potter,	-----	-----	2	-----	2
J. H. Drake,	Slippery Rock,	Butler,	1	-----	3	-----	4
Lewis J. Drake,	Springville No. 2,	Susquehanna,	1	-----	12	8	21
John W. Dulles,	West Chester,	Chester,	1	-----	2	-----	3
W. M. Duncan,	Lawsonham,	Clarion,	-----	1	3	3	7
J. W. Duart,	Canton,	Bradford,	1	-----	1	-----	2
J. Ernest Dunkle,	Quarryville No. 3,	Lancaster,	1	1	6	1	9
Henry D. Dunn,	Herrick Center,	Susquehanna,	-----	-----	1	-----	1
Truman D. Dunn,	Herrick Center,	Susquehanna,	-----	-----	5	-----	5
Frank E. Dunshie,	Millport,	Potter,	-----	1	6	3	10
Clayton C. Dyke,	Mansfield,	Tioga,	1	-----	-----	-----	1
L. W. Eastman,	McKean,	Erie,	1	-----	5	-----	6
B. F. Edwards,	Wellsboro,	Tioga,	1	-----	2	-----	3
John H. Ehrhart,	Glenville,	York,	2	6	8	6	22

HOLSTEIN FRIESIAN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. B. Elder,	Volant No. 3,	Lawrence,			6	2	8
E. D. Ellsworth,	Meshoppen No. 4,	Wyoming,	1	1	29	8	39
Ellsworth & VanGilder,	Stevensville No. 33,	Bradford,	3		12		15
C. E. Erdley,	Lewisburg,	Union,	1		3	2	6
G. F. Erdley,	Lewisburg,	Union,	1		9		10
T. J. Erdley,	Lewisburg,	Union,		1	4		5
Chas. M. Eroh,	Wapwallopen,	Luzerne,	1	2	3		6
B. L. Erskine,	Rummerfield,	Bradford,	1				1
L. S. Erway,	Raymond,	Potter,	1	1	3	2	7
Wm. A. Evans,	Indiana No. 5,	Indiana,			2	3	5
Wm. J. Fairchild,	Berwick,	Columbia,	1	1	5	1	8
Emlen C. Faucett,	West Chester No. 5,	Chester,	1		2		3
L. S. Faulkner,	Westfield No. 4,	Tioga,			1		1
John A. Featherman,	Nottingham,	Chester,	1		2		3
C. W. Fish,	Wyalusing,	Bradford,	1	1	4	2	8
J. E. Fleisher,	Newport,	Perry,	1	3	12	4	20
R. H. Fleming,	Alba,	Bradford,	1		1	1	3
Stanley Fletcher,	New Milford,	Susquehanna,	1				1
Flock Brewing Co.,	Williamsport,	Lycoming,	1		22		23
Irvine J. Focht,	Wellsboro,	Tioga,	1	1	5	3	10
C. F. Follett,	Corry No. 4,	Erie,	1		7		8
C. Jay Follett,	Corry No. 5,	Erie,	1		4		5
Clarence D. Fortnam,	Tyler Hill,	Wayne,	1	1	26	12	40
Fred S. Fortner,	Wrights,	McKean,		1	1		2
E. E. Francis,	Wellsboro No. 8,	Tioga,	1				1
E. Clinton Fretz,	Quakertown No. 1,	Bucks,	1		7	4	12
T. R. Fries,	West Newton,	Westmoreland,	3		13	3	19
F. W. Frost,	Mansfield No. 4,	Tioga,	1				1
H. A. Gackenbach,	Meadville,	Crawford,	1		3		4
Galbreath Bros.,	Delta,	York,	1		4		5
Geo. H. Gates,	Shadeland No. 97,	Crawford,	1	1	3	1	6
H. C. Gates,	Canton,	Bradford,	1	1	8		10
F. A. Gavitt,	Montrose No. 3,	Susquehanna,	1	1	2	1	5
Allen M. Gehman,	Macungie,	Lehigh,	1	1	7		9
George School,	George School,	Bucks,	1	1	1		3
W. Berwyn Gere,	Laceyville,	Wyoming,	1				1
H. C. Gernert,	Breinigsville,	Lehigh,			3		3
L. C. Gerow,	Knoxville No. 2,	Tioga,	1		8	1	10
Robert Getty,	Glen Riddle,	Delaware,	1		6	1	8
J. C. Gilleland,	Bellevue No. 4,	Allegheny,		1	1		2
Manning Gillespie,	New Milford,	Susquehanna,			2		2
M. S. Gillespie,	Edinboro,	Erie,	1		4		5
C. M. Gillette,	Colegrove,	McKean,	1				1
G. B. Ginter,	Newville,	Cumberland,	1				1
Glade Royal Farms,	Somerset, Box 222,	Somerset,	1	1	11	5	18
Wm. A. Good,	Wapwallopen,	Luzerne,	1	1	6	2	10
Lyman D. Goodspeed,	Wellsboro,	Tioga,			2		2
W. R. Gorham,	Muncy,	Lycoming,	2				2
W. E. Gorman,	Upper Darby,	Delaware,	1		9		10
James H. Graeff,	Tulpehocken,	Berks,	1		5	1	7
L. C. Graves,	Springboro,	Crawford,	1	1	9	3	14
F. G. Greenfield,	Edinboro,	Erie,	1	1	30	1	33
G. C. Greenfield,	Linesville,	Crawford,			4	1	5
Wm. H. Greenough,	Sunbury,	Northumberland,	1				1
Geo. Greer,	New Castle,	Lawrence,	1	6	45	6	58
John W. Greer,	Centreville,	Crawford,	1		2	1	4
G. A. Gridley,	Ulysses No. 2,	Potter,			5		5
S. A. Griffin,	Sabinsville,	Tioga,		1	3	2	6
W. C. Griffith,	Malvern,	Chester,	2		3		5
O. S. Grim,	Allentown,	Lehigh,	1	1	16	6	24
Albert B. Groff,	E. Petersburg,	Lancaster,	1	1	5	1	8
Isaac S. Gross,	Plumsteadville,	Bucks,	1		4	1	6
F. F. Gruber,	Annville No. 1,	Lebanon,	2				2
H. T. Gumble,	Gumbles,	Pike,			1	1	2
John Gygger,	Kimberton,	Chester,	1	1	12	3	17
G. R. Hagey,	Martinsburg,	Blair,	1		1		2
C. L. Hall,	Corry,	Erie,	1		14	4	19
Eugene D. Hall,	Doe Run,	Chester,	1			2	3

HOLSTEIN FRIESIAN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old	Females under 1 year old.	Total.
J. H. Hamilton,	Canonsburg No. 2,	Washington,	1	-----	6	-----	7
H. S. Harrison,	Canonsburg No. 3,	Washington,	1	-----	1	2	4
Henry C. Hartenbach,	Monaca,	Beaver,	1	1	5	-----	7
J. C. Hartt & Sons,	Susquehanna,	Susquehanna,	-----	1	-----	1	2
George T. Hatherill,	Wellsboro,	Tioga,	1	-----	1	-----	2
D. L. Haven,	Smethport,	McKean,	1	-----	7	-----	8
Arthur Hay,	East Rush,	Susquehanna,	1	2	6	3	12
J. C. Hays,	Bridgeville No. 1,	Allegheny,	1	-----	3	-----	4
S. C. Hays,	Imperial,	Allegheny,	1	1	24	4	30
Wm. W. Hayes,	Cogan Station,	Lycoming,	2	-----	4	2	8
A. P. Hazen,	Ellwood City No. 2,	Lawrence,	1	-----	11	-----	12
John Heinrich,	Galeton No. 1,	Potter,	2	-----	6	1	9
A. G. Henry,	Linesville,	Crawford,	1	-----	6	2	9
E. C. Herrick,	Cambridge Springs,	Crawford,	1	-----	2	-----	3
John H. Hicks,	Avondale,	Chester,	1	2	12	5	20
W. H. Hicks,	West Chester No. 2,	Chester,	3	7	29	6	45
Geo. R. Hill,	Towanda,	Bradford,	1	4	12	4	21
Samuel N. Hill, Jr.,	Markham,	Delaware,	1	-----	2	2	5
Mrs. Etta C. Hine,	Thompson No. 1,	Susquehanna,	1	-----	2	-----	3
Enos H. Hirst,	Chambersburg,	Franklin,	1	-----	1	-----	2
Sellers Hoffman,	Chadds Ford,	Delaware,	2	1	1	1	5
Louis Hohn,	Brooklyn,	Susquehanna,	1	-----	1	-----	2
Simon G. Hollinger,	Waynesboro,	Franklin,	2	-----	23	-----	25
F. A. Holmes,	Volant No. 3,	Lawrence,	1	-----	11	4	16
D. P. Honeywell,	Dallas,	Luzerne,	-----	-----	11	1	12
Harry L. Hoopy,	West Fairview,	Cumberland,	1	-----	2	1	4
Geo. F. Horton,	New Albany No. 45,	Bradford,	1	1	21	6	29
E. L. Hotchkiss,	McLane,	Erie,	1	3	17	9	30
J. S. Howard,	Lynn,	Susquehanna,	-----	-----	9	-----	9
L. B. Howe,	Ulysses,	Potter,	3	-----	11	-----	14
E. C. Howell,	Wellsboro,	Tioga,	-----	-----	1	-----	1
Edgar Huidekoper,	Meadville,	Crawford,	-----	-----	2	1	3
H. D. Hunsberger,	Plumsteadville,	Bucks,	1	-----	5	-----	6
E. R. Huyck,	Starrucca,	Wayne,	1	1	5	-----	7
Frank Hyde,	Millport,	Potter,	1	2	4	1	8
W. W. Inscho,	Canoe Camp,	Tioga,	1	1	3	2	7
Alta Jackson,	Linesville,	Crawford,	1	-----	4	-----	5
C. C. Jennes,	Girard,	Erie,	1	-----	3	1	5
Cortez H. Jennings,	Towanda,	Bradford,	-----	-----	5	1	6
W. Worth Jennings,	Towanda,	Bradford,	-----	3	25	4	32
W. B. Jerald,	Mansfield,	Tioga,	1	-----	6	-----	7
W. B. & Chas. T. Jerald,	Mansfield,	Tioga,	1	1	12	2	16
Erwin G. Johnson,	Hop Bottom,	Susquehanna,	-----	1	2	1	4
Harry S. Johnson,	Quakertown,	Bucks,	1	1	-----	-----	2
J. F. Johnson,	Hop Bottom No. 1,	Susquehanna,	1	-----	2	1	4
S. W. Johnson,	Nicholson No. 1,	Susquehanna,	1	-----	3	-----	4
W. A. Johnson,	Berwick,	Columbia,	1	-----	2	-----	3
V. W. Johnston,	Westfield No. 5,	Tioga,	1	-----	6	-----	7
Albert Jones,	Centreville,	Crawford,	2	-----	3	-----	5
A. H. Jones,	South Montrose,	Susquehanna,	-----	1	3	-----	4
B. F. Jones,	South Montrose,	Susquehanna,	1	1	16	3	21
Charles Jones,	Centreville No. 92,	Crawford,	2	1	7	3	13
Clement R. Jones,	Pittsburgh,	Allegheny,	2	-----	5	3	10
Harry A. Jones & Bros.,	Beallsville No. 1,	Washington,	1	2	7	2	12
Wm. F. Kaste,	McDonald,	Washington,	1	-----	3	3	7
E. E. Keck,	Duncannon,	Perry,	1	-----	-----	-----	1
Ray N. Keeler,	Milan,	Bradford,	1	11	3	-----	15
C. E. Kemmerer,	Bethlehem No. 1,	Northampton,	1	-----	2	2	5
J. L. Kent,	Montrose,	Susquehanna,	1	2	4	2	9
H. J. Kenyon,	Troy No. 64,	Bradford,	-----	-----	2	-----	2
J. H. Kernan,	Westfield No. 4,	Tioga,	1	-----	3	2	6
J. G. Kerrick,	Towanda No. 9,	Bradford,	1	4	10	7	22
A. L. Kessler,	Brandt,	Susquehanna,	1	1	4	1	7
Alfred C. King,	North East,	Erie,	1	-----	2	-----	3
Edw. E. Kinsman,	Honesdale,	Wayne,	1	1	8	2	12
Mrs. Olive Kirkendall,	Dallas,	Luzerne,	-----	-----	4	-----	4
Geo. Kittle,	Granville Summit,	Bradford,	1	1	2	2	6

HOLSTEIN FRIESIAN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
B. F. Knierman,	Linesville,	Crawford,			2		2
F. E. Knights,	Troy,	Bradford,		1	1	1	3
Lackawanna Breeders' Association.	Clarks Summit,	Lackawanna,	1		44	17	62
G. M. Lake,	Springville,	Susquehanna,	1		13	4	18
Homer G. Lake,	Montrose No. 4,	Susquehanna,	2		25	5	32
L. E. & M. A. Lamont,	Conneautville,	Crawford,		1		2	3
D. W. Lane,	East Smithfield,	Bradford,	1		1		2
Fred N. Langdon,	Newfield,	Potter,	1	1	2		4
A. P. Larimer,	Van Meter,	Westmoreland,	1	6	24	10	41
C. S. Lathrop,	Elk Lake,	Susquehanna,			2		2
W. A. Lathrope,	Montrose,	Susquehanna,			4		4
William J. Latta,	Norristown No. 4,	Montgomery,	1		15	3	19
Samuel U. Lear,	Walnut Bottom,	Cumberland,	1		4		5
Elmer E. Lee,	Starrucca,	Wayne,	1	1	12	4	18
S. Blaine Lehman,	Chambersburg No. 3,	Franklin,	1	2	4	1	8
J. Geo. Leipold,	Midway, Box 221,	Washington,	1		3	2	6
F. P. Lesh,	Oil City,	Venango,	1				1
A. E. Lesher,	Chambersburg, R. D.,	Franklin,	1		3	1	5
Mrs. Mary J. Lester & Son.	Conneautville,	Crawford,	1	1	4	2	8
F. W. Levis,	Chadds Ford No. 1,	Delaware,	1	1	12	4	18
F. S. Lewis,	Port Allegany,	McKean,			1	1	2
H. L. Lewis,	Montrose No. 3,	Susquehanna,		1	8		9
W. D. Lewis,	Ulysses,	Potter,	1		1	1	3
Clifton L. Lindsey,	Corry,	Erie,	1		10	3	14
E. H. Lindsey,	Corry,	Erie,	1		5		6
Harry A. Lindsey,	Corry,	Erie,	1		3	2	6
Free Linn,	Espyville,	Crawford,	1		7		8
J. K. Linn,	Espyville Station,	Crawford,	1	1	6	2	10
Wm. J. Little,	Potterbrook,	Tioga,			1		1
R. W. Lohr,	Boswell,	Somerset,	1				1
J. T. Long,	Coleman,	Somerset,	1		1		2
Geo. S. Loucks,	Alverton,	Westmoreland,	1	1	3		5
C. E. Lowe,	Montrose No. 4,	Susquehanna,	1		6		7
Chas. W. Lowey,	Chambersburg No. 11,	Franklin,		2	2		4
E. R. Loy,	Loysville,	Perry,	2		2	1	5
W. H. Ludlam,	Knoxville,	Tioga,			2	2	4
P. H. Lyman,	Tunkhannock No. 1,	Wyoming,	1		7	2	10
T. C. Lyon,	Laceyville,	Wyoming,	1		4		5
R. H. MacDade,	Oaks,	Montgomery,	1		17		18
J. A. McCalmont & Son,	Bulger No. 1,	Washington,	1		17	6	24
James K. McCalmont,	Bulger No. 1,	Washington,	1				1
J. M. McCamant,	West Chester,	Chester,	2		8	2	12
T. L. McCarrell,	Hickory,	Washington,	1		5		6
L. Lee McClure,	West Chester,	Chester,	2		6	3	11
Wm. H. McClurg,	Hookstown,	Beaver,		1	5		6
John B. McDuffee,	Wilawana,	Bradford,	1		7		8
Mrs. E. S. McElhany,	Noblestown,	Allegheny,	1	1	11	4	17
Jas. A. McKean,	Smethport,	McKean,	1				1
J. A. McLain,	Allenport,	Washington,	1	1	3		5
Samuel McLaud,	Laceyville,	Wyoming,			2		2
E. R. McLaughlin,	Greenville,	Mercer,			2		2
J. K. McLaughlin,	Spruce Hill,	Juniata,	1		2		3
R. S. McLaughlin,	Jamestown,	Mercer,			1		1
F. R. McMahon,	Altoona No. 1,	Blair,	1	1	13	3	18
James McMurray,	West Alexander,	Washington,	1	1	7	1	10
E. A. Macaffee,	Athens,	Bradford,	1				1
Macaffee Bros.,	Athens,	Bradford,		1	1		2
Geo. J. Mackle,	Seelyville,	Wayne,	1		1		2
John W. Madden,	Wellsboro,	Tioga,	1	4	3	3	11
Z. R. Manning,	Montrose,	Susquehanna,	1		9		10
J. B. Manson,	Rea,	Washington,			12	2	14
E. L. Manzer,	South Gibson,	Susquehanna,	1	1	5	1	8
Ira M. Marlin,	Creekside No. 1,	Indiana,			4	2	6
D. F. Maroney,	Washington No. 10,	Washington,	1		8		9
E. L. Martin,	Greencastle,	Franklin,	2		3	1	6
J. I. Marsh,	Geneva,	Crawford,	1				1

HOLSTEIN FRIESIAN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
M. H. Masland,	Richboro No. 25,	Bucks,	1		7		8
Alfred Mathews,	New Britain,	Bucks,	1		1		2
W. E. Matthews,	Johnstown,	Cambria,	1				1
A. W. Mawhinney,	Canonsburg No. 3,	Washington,	1		7		8
W. C. Maxwell	Derrick City,	McKean,	1		4		5
Amasa C. Maynard,	Troy,	Bradford,			2		2
M. B. C. Orphanage and Home.	Centre Valley,	Lehigh,	1		27	1	29
Milton Mellott,	Sipe Mill,	Fulton,	2				2
J. F. Melvin,	Greenville,	Mercer,	1		18	2	21
Melvin Farm Co.,	Bradford,	McKean,	1	1	7	4	13
W. B. Merriman,	Waterford,	Erie,	1				1
Wm. C. Merritt,	Philadelphia,	Philadelphia,		1	5	2	8
L. A. Meyers,	Hooversville,	Somerset,	1	2	9		12
Linford Michener,	Colmar,	Montgomery,	1		10		11
W. M. Mickey,	Greencastle,	Franklin,	1		6	2	9
Guy O. Mickle,	Centreville,	Crawford,	1		4	1	6
Arch Miller	Dalton No. 3,	Lackawanna,			6	2	8
A. I. Miller,	Homer City No. 3,	Indiana,	1		4	1	6
Arthur J. Miller,	Clarks Summit,	Lackawanna,	1	1	33	11	46
E. S. Miller,	Ransom,	Lackawanna,	1				1
H. A. Miller,	Williamsport,	Lycoming,	2		9	2	13
Jay B. Miller,	Chambersburg,	Franklin,	2	4	18	6	30
Mrs. John C. Miller,	Canonsburg No. 2,	Washington,			2		2
John D. Miller,	Susquehanna,	Susquehanna,	1	1	5	2	9
Murray A. Miller,	Milton No. 3,	Northumberland,	1	1	5		7
P. H. Miller,	Ulysses,	Potter.		1	6	5	12
Samuel A. Miller,	Linden No. 3,	Lycoming,	2		16	3	21
S. R. Miller & Sons,	Chambersburg,	Franklin,	1	3	20	6	30
E. G. Mitchell,	Waterford,	Erie,	1		3	1	5
Henry J. Mitchell,	Wellsboro No. 2,	Tioga,	1				1
A. L. Moats,	Jamestown,	Mercer,			11	3	14
John C. Moats & Sons,	Jamestown,	Mercer,	1		6		7
Robert H. Moffitt, Jr.,	Harrisburg,	Dauphin,	2				2
Harry L. Mohn,	Jersey Shore No. 3,	Lycoming,	2		6		8
O. N. Molyneux,	Dushore,	Sullivan,	1				1
C. E. Moore,	Mansfield,	Tioga,	1	4	10	3	18
Frank C. Moore,	Wellsboro,	Tioga,	1		2		3
J. B. Moore,	Garland,	Warren,	4	16	70	27	117
Wm. A. Moore,	Glen Moore,	Chester,	1	1	11	2	15
Chas. H. Morgan,	Osceola,	Tioga,	1		11		12
Coral I. Morgan,	Osceola No. 1,	Tioga,			2	1	3
J. W. Mosher,	Damascus,	Wayne,	1	1	2	1	5
Harry A. Myers,	Eighty Four,	Washington,	2	1	18	4	25
O. J. Neal,	Bulger No. 1,	Washington,	1		10		11
L. Nearing,	Troy,	Bradford,	1		13	1	15
C. W. Newman,	Wyalusing,	Bradford,	2	4	14	5	25
J. S. Nicholas & Son,	Watsontown,	Northumberland,		1	2	3	6
C. R. Nichols,	Shinglehouse,	Potter,	2	1	14		17
Mrs. Wm. F. Norris,	Philadelphia,	Philadelphia,	2		34	2	38
O. S. Nye,	Rutland,	Tioga,	1		2		3
N. A. Ostrum,	Emporium,	Cameron,	1		5		6
James Packard,	Canton,	Bradford,	1		6	2	9
Geo. E. Page,	Gelatt,	Susquehanna,		1	6	3	10
H. E. Palmer,	Montrose No. 4,	Susquehanna,	1		1	1	3
H. Fred Palmer,	Canton No. 72,	Bradford,		1	4	1	6
A. Lee Parker,	Westfield,	Tioga,	1	3	23	8	35
P. E. Parker,	Westfield,	Tioga,	1	1	10	4	16
R. W. Parker,	Greenville,	Mercer,			4	1	5
J. D. Patterson,	Wellsboro,	Tioga,	1	3	14	8	26
Milo F. Patterson,	Wellsboro No. 9,	Tioga,			5		5
O. D. Patterson,	Covington,	Tioga,	1	2	10	1	14
W. H. Patterson,	Mansfield,	Tioga,	1	5	12	10	28
Patterson Bros.,	McConnellsburg,	Fulton,	1	1	1		3
W. M. Paul,	Hickory No. 1,	Washington,	1		6	2	9
Geo. G. Paxton,	Houston,	Washington,	1	3	18	4	26
Isaac Paxton,	Canonsburg,	Washington,	1		5		6

HOLSTEIN FRIESIAN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Jas. M. Paxton,	Houston,	Washington,	3	1	14	-----	18
John G. Paxton,	Canonsburg No. 1,	Washington,	-----	-----	5	-----	5
F. P. Payne,	Kingsley No. 1,	Susquehanna,	1	-----	5	-----	6
S. J. Pennock,	Chatham,	Chester,	1	-----	3	-----	4
Penna. Epileptic Hospital and Colony Farm.	Oakbourne,	Chester,	2	-----	4	-----	6
Penna. State College,	State College,	Centre,	-----	1	-----	1	2
Penna. State Lunatic Hospital.	Harrisburg,	Dauphin,	3	-----	1	-----	4
Alonzo Perkins,	Millport,	Potter,	1	-----	1	1	3
Peterson & Johnson,	Kane No. 1,	McKean,	-----	-----	2	1	3
Otto S. Pethick,	Milanville,	Wayne,	1	1	13	3	18
H. Wayne Pierce,	Towanda No. 2,	Bradford,	1	-----	-----	-----	1
Thos. R. Pierson,	Oxford,	Chester,	1	1	7	2	11
T. K. Place,	Quakertown,	Bucks,	1	5	9	-----	15
R. W. Plunkett,	Canonsburg,	Washington,	1	-----	6	-----	7
Jno. W. Pomeroy,	Troy,	Bradford,	2	-----	-----	-----	2
Nelson Poorbaugh,	Mt. Pleasant,	Westmoreland,	-----	-----	2	1	3
Samuel Porter,	Jamestown,	Mercer,	1	-----	-----	-----	1
Potter County Home,	Coudersport,	Potter,	3	-----	11	-----	14
Powell Bros.,	Shadeland,	Crawford,	4	5	18	3	30
C. A. Pratt,	LeRaysville,	Bradford,	1	-----	22	-----	23
L. W. Pratt,	LeRaysville,	Bradford,	1	-----	26	3	30
L. D. Putnam,	Akeley,	Warren,	1	1	10	2	14
Harry Quivey,	Wylandville,	Washington,	1	4	16	4	25
J. Harry Rakestraw,	Williamsport,	Lycoming,	-----	5	13	8	26
S. Y. Ramage,	Oil City,	Venango,	1	-----	2	-----	3
Jason G. Rauck,	Ronks No. 2,	Lancaster,	1	-----	1	1	3
Jonas Raudabaugh,	Carlisle No. 9,	Cumberland,	1	-----	-----	-----	1
Thos. L. J. Reese,	Linden,	Lycoming,	1	-----	13	1	15
Milton Renner,	Saegertown,	Crawford,	-----	-----	2	1	3
H. B. Replogle,	Curryville,	Blair,	1	-----	2	1	4
F. F. Resseguie,	South Gibson,	Susquehanna,	2	5	17	6	30
A. Brinton Reynolds,	Avondale,	Chester,	1	1	2	2	6
G. H. Reynolds,	Alba,	Bradford,	1	5	9	4	19
H. C. Reynolds,	Scranton,	Lackawanna,	1	1	2	1	5
L. H. Reynolds,	Uniondale,	Susquehanna,	1	2	7	1	11
Wm. B. Rhoads,	Westtown,	Chester,	-----	-----	1	-----	1
C. S. Richards,	Ransom,	Lackawanna,	1	-----	-----	-----	1
F. S. Richardson,	Montrose No. 3,	Susquehanna,	1	-----	1	-----	2
J. E. Ricker,	St. Thomas,	Franklin,	1	-----	-----	-----	1
Foster M. Riker,	Factoryville No. 1,	Wyoming,	1	-----	14	-----	15
B. C. Roberts,	Meshoppen,	Wyoming,	1	-----	3	-----	4
A. E. Robinson,	Montrose,	Susquehanna,	2	1	14	5	22
H. Roblyer,	Wellsboro No. 2,	Tioga,	-----	1	-----	-----	1
L. H. Rooks,	Mills,	Potter,	1	1	-----	-----	2
George Rose,	Honesdale No. 2,	Wayne,	1	-----	1	-----	2
Arthur Rousseaux,	Belle Vernon,	Fayette,	1	-----	1	-----	2
Geo. W. and Chas. A. Row.	Yardley,	Bucks,	3	-----	29	7	39
Mark Rudkin,	Transfer,	Mercer,	-----	1	1	-----	2
Peter Rush,	Orefield,	Lehigh,	1	-----	3	-----	4
W. S. Russell,	Bulger,	Washington,	1	-----	-----	-----	1
Jos. T. Ryburn,	Washington No. 10,	Washington,	-----	-----	1	-----	1
Robert D. Sampson,	Crooked Creek,	Tioga,	1	-----	-----	-----	1
Dwight M. Sargeant,	East Smithfield,	Bradford,	1	-----	-----	-----	1
W. D. Sargent Est.,	Somerset,	Somerset,	-----	1	11	7	19
W. E. Sawyer,	Wrights,	McKean,	2	1	4	3	10
Edw. H. Scholl,	Allentown No. 2,	Lehigh,	1	3	8	2	14
Chas. Schrader,	Canton,	Bradford,	-----	1	1	-----	2
J. K. Scott,	Elizabeth,	Allegheny,	1	-----	4	-----	5
Walter K. Sharpe,	Chambersburg,	Franklin,	5	-----	28	-----	33
J. C. Shaw,	Conneautville,	Crawford,	1	-----	6	1	8
W. L. Shaw,	Washington No. 1,	Washington,	1	-----	3	-----	4
J. B. Sheen,	South Montrose,	Susquehanna,	1	-----	3	1	5
J. Terrance Sheen,	South Montrose,	Susquehanna,	-----	-----	2	-----	2
H. D. Sheppard,	Hanover,	York,	2	1	5	3	11
W. H. Shellito,	Espyville Station,	Crawford,	1	1	2	-----	4

HOLSTEIN FRIESIAN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
L. L. Shreve,	Spartansburg,	Crawford,	1				1
Siegel Bros.,	Williamsport,	Lycoming,	1	3	6	4	14
A. F. Siegfried,	Portland,	Northampton,			8	1	9
C. A. Simons,	Kingsley No. 2,	Susquehanna,	1		4		5
J. P. Simpson,	Saxonburg,	Butler,	1	1	2		4
W. L. Simpson,	Canonsburg No. 3,	Washington,	2	1	26	5	34
A. C. Slifer,	Woodward,	Centre,	1	5	13	2	21
T. E. Smedley,	Anselma,	Chester,	1		4	1	6
B. Smith & Son,	Granville Summit,	Bradford,	1				1
G. Smith & Sons,	Seelyville,	Wayne,	1	1	5	3	10
L. W. Smith,	Reynoldsville No. 2,	Jefferson,	1	1	1		3
Perry R. Smith,	Ridgway,	Elk,	2		3		5
Wm. F. Smith,	Greenville,	Mercer,		1	5	2	8
Wm. M. Smith,	Covington No. 2,	Tioga,			2		2
Blair S. Snoberger,	Roaring Springs,	Blair,	1		3		4
C. L. Snyder,	Kingsley,	Susquehanna,	1		17	3	21
Henry J. Soety,	McKean,	Erie,	1		5		6
A. G. Southworth,	Franklin Forks,	Susquehanna,	1		2		3
L. D. Southworth,	Little Marsh,	Tioga,	1	1	4		6
S. E. Speck,	Greencastle,	Franklin,	1	1	4	2	8
Ernest B. Spencer,	Millerton,	Tioga,			5		5
G. A. Spencer,	Waverly,	Lackawanna,	1		12	2	15
N. D. Spencer,	Towanda,	Bradford,	1				1
W. G. Squires,	Hop Bottom,	Susquehanna,	1		1		2
James H. Stahler,	S. Bethlehem No. 2,	Northampton,	1	1	5		7
S. J. Stahlman,	Brookville No. 6,	Jefferson,				1	1
H. C. Stanton,	Clifton Heights,	Delaware,	2	2	17	4	25
C. Audley Stark,	Factoryville No. 1,	Wyoming,	1		10	3	14
State Hospital for the Insane,	Warren,	Warren,	4		11		15
State Institution for Feeble-Minded,	Polk,	Venango,	7	1	120	11	139
Thos. Steel,	West Grove,	Chester,	2		12	2	16
J. H. Stephens,	New Florence No. 2,	Westmoreland,			7	5	12
W. S. Sterling,	Brooklyn,	Susquehanna,	1		7	1	9
D. N. Sterner,	Richland Center,	Bucks,	1	1	6	2	10
L. G. Stevens,	Harrison Valley,	Potter,	1	1	6		8
C. W. Stevenson,	Reynoldsville No. 2,	Jefferson,		1	2	1	4
L. J. Stewart & Son,	Imperial No. 2,	Allegheny,	2	2	13	1	18
L. T. Stone,	Mills,	Potter,		1	7	2	10
A. O. Storch,	E. Smithfield,	Bradford,	1	2	6	3	12
J. H. Storch,	E. Smithfield,	Bradford,	2		7	2	11
Herman Straub,	Murdocksville,	Washington,	4	2	9	4	19
I. M. Strickland,	Hop Bottom,	Susquehanna,	1	2	9	2	14
Harvey Strohm,	Walnut Bottom,	Cumberland,		1	5	1	7
Vern T. Stuble,	Athens,	Bradford,	1				1
J. B. W. Stufft,	Ralphton,	Somerset,	1			1	2
A. F. Sturdevant,	Franklin Forks No. 2,	Susquehanna,	1	1	7	4	13
Asa R. Sturtevant,	Springboro,	Crawford,	1		7		8
J. J. Sullivan,	Genesee,	Potter,	1		3	1	5
M. N. Sullivan,	New Albany,	Bradford,	1		3		4
Jessie Sumner,	East Smithfield,	Bradford,		1	2		3
W. T. Suter,	Riverside,	Northumberland,		4	24	8	36
G. A. Sweet,	Hop Bottom,	Susquehanna,		1	1	1	3
W. S. Sweet,	Troy,	Bradford,	2	1	46	11	60
Chas. H. G. Sweigart,	Avondale,	Chester,			4	4	8
Howard L. Taber,	Edinboro,	Erie,	3	1	8	1	13
C. H. Tallman,	McLane,	Erie,			1		1
G. E. Tanger,	York Springs No. 4,	Adams,	1		3	2	6
G. M. Tarbox,	Ulysses No. 3,	Potter,	1		2		3
Mrs. Dyer Taylor,	Lynn,	Susquehanna,			2		2
Harry F. Taylor,	West Chester,	Chester,		4			4
I. M. Taylor,	Meshoppen No. 2,	Wyoming,	1		1		2
J. V. Taylor & Son,	Wyalusing,	Bradford,		2	6	2	10
W. E. Taylor,	Lynn,	Susquehanna,	1		15		16
Philip Tenbrook,	Malvern No. 3,	Chester,			10		10
Frank Terry,	Linesville,	Crawford,	1	1	2		4

HOLSTEIN FRIESIAN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
G. E. Tewksbury,	Brooklyn,	Susquehanna,	1		4		5
John L. Thayer,	Linesville, R. D.,	Crawford,			3		3
Chas. H. Thomas,	Cambridge Springs,	Crawford,	1	1	2	2	6
John G. Thomas,	Frazer,	Chester,	1		2		3
F. L. Thompson,	Schultzville,	Lackawanna,	1	1	2	1	5
M. A. Thompson,	Wellsboro No. 9,	Tioga,	1		1		2
Mrs. Mary E. Thompson,	Linesville,	Crawford,	1		5		6
W. F. Throop,	Espyville Station,	Crawford,	2	4	21	13	40
E. R. Tiffany,	Hallstead No. 2,	Susquehanna,	1	1	1	1	4
John W. Tindall,	E. Downingtown,	Chester,	2	1	3	1	7
Morris Tingley,	Hop Bottom,	Susquehanna,	1	1	2		4
R. D. Tingley,	Hop Bottom,	Susquehanna,	1	3	9	4	17
G. D. Tinsman,	Williamsport,	Lycoming,	1	1	9	4	15
Clarence H. Titus,	Tunkhannock No. 2,	Wyoming,	1		10	4	15
Fred Towner,	Heart Lake,	Susquehanna,	1		2		3
C. D. Frairs,	Factoryville No. 1,	Wyoming,	1				1
Dorr Trowbridge,	Westfield,	Tioga,			3	1	4
Harry H. Trumbauer,	Quakertown No. 1,	Bucks,	1	1	22		24
Chas. R. Turn,	E. Stroudsburg,	Monroe,	1		5		6
Edward W. Twaddell,	Westtown,	Chester,	1	1			2
F. M. Twining, Mgr.,	Wycombe,	Bucks,	2		4		6
Wilmer A. Twining,	Wycombe,	Bucks,	1	1	2		4
R. D. Ulmer,	Cogan Station No. 1,	Lycoming,			1		1
C. L. Updike,	Daggett,	Tioga,	2		14	2	18
H. G. Vail,	Damascus,	Wayne,	1		5	1	7
John VanAllen,	Lovelton,	Wyoming,	1		3	3	7
W. H. VanCott,	New Milford No. 4,	Susquehanna,	1	1	5	2	9
Geo. Vanderhoof & Son,	Middlebury Center,	Tioga,	1	2	7	3	13
C. G. VanWinkle & Sons.	Linesville,	Crawford,		1	5	2	8
B. F. Vogelsong,	Mechanicsburg,	Cumberland,	1		5		6
G. B. Wachob & Son,	Luthersburg,	Clearfield,	3	7	12	4	26
A. M. Waid,	Conneaut Lake,	Crawford,	1		4		5
J. D. Walsh,	Linesville,	Crawford,			2		2
Wm. H. Walter,	Quakertown,	Bucks,	1		9	5	15
J. W. Walworth,	New Milford,	Susquehanna,			3		3
A. P. Warren,	Elizabeth,	Allegheny,	2	1	26	3	32
Washington Co. Home,	Washington,	Washington,	1	1	10	3	15
Geo. Watson,	Doylestown,	Bucks,	1				1
Horace L. Way,	Fairville,	Chester,	1	3	17	1	22
J. H. Webb,	Montrose,	Susquehanna,	1				1
W. B. Webb,	Montrose,	Susquehanna,	1		1	1	3
Elwood Webster,	Oxford,	Chester,	2		4	2	8
L. A. Wells,	South Montrose,	Susquehanna,	1		2		3
N. J. Wells,	Tunkhannock,	Wyoming,			1		1
Reuben D. Wenrich,	Wernersville,	Berks,	2	1	5	3	11
E. M. Werkeiser,	Stroudsburg,	Monroe,	1	1	2	1	5
W. F. West,	Wellsboro,	Tioga,	1	1	2		4
W. S. Wheeland,	Williamsport,	Lycoming,			2		2
D. J. Whipple,	Ulysses,	Potter,		2	6	2	10
F. B. Whitcomb,	Sugar Grove No. 3,	Warren,	1		2	1	4
G. B. Whitcomb,	Chandlers Valley,	Warren,			1		1
Mrs. Florence E. White,	Waterford No. 1,	Erie,	2		9	4	15
John W. White,	Uniondale No. 1,	Susquehanna,	1		14		15
Thos. C. White,	Westford,	Crawford,	2		7	1	10
Amsey Whitebread,	Wapwallopen,	Luzerne,			1	1	2
M. F. Whitebread,	Wapwallopen,	Luzerne,			1		1
Paul Whitebread,	Wapwallopen No. 3,	Luzerne,	1	2	6	3	12
Nelson L. Whitteker,	Mansfield,	Tioga,	1	1	12	4	18
Peter H. Whitteker,	Mansfield,	Tioga,		2	9		11
Wm. B. Wickersham,	Embreeville,	Chester,	1		27		28
B. W. Wilcox,	New Albany,	Bradford,	1		28	5	34
E. E. & J. R. Wilcox,	Granville Summit No. 69.	Bradford,	1				1
G. H. & F. C. Wilcox,	New Albany,	Bradford,			6	2	8
Wm. Wildrick,	Linesville,	Crawford,			4	2	6
Harry W. Wilkinson,	Wellsboro No. 10,	Tioga,	1	3	5		9

HOLSTEIN FRIESIAN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Geo. W. Williams,	Canton,	Bradford,	-----	-----	2	-----	2
Lewis H. Williams,	Tunkhannock,	Wyoming,	-----	1	-----	-----	1
R. G. Williams,	Canton,	Bradford,	1	2	8	5	16
I. T. Wilmarth,	Hop Bottom,	Susquehanna,	1	-----	3	1	5
R. W. Wilson,	Eighty Four No. 1,	Washington,	-----	-----	20	3	23
R. W. Wilson,	Nottingham,	Chester,	1	-----	10	-----	11
W. J. Wilson,	Imperial,	Allegheny,	-----	-----	6	-----	6
J. B. Winkelblech,	Milton No. 4,	Northumberland,	1	-----	-----	-----	1
Robert Winship,	Moscow,	Lackawanna,	3	-----	-----	-----	3
Henry Wisler,	Columbia,	Lancaster,	1	-----	3	-----	4
S. T. Witmer,	Union Deposit,	Dauphin,	1	-----	4	3	8
H. D. Wood,	Wellsboro No. 9,	Tioga,	1	-----	-----	-----	1
Woodford Brothers,	Waterford,	Erie,	-----	-----	1	1	2
W. A. Woods,	Huntsdale,	Cumberland,	1	-----	5	3	9
A. M. Woodworth & Son,	Troy No. 63,	Bradford,	1	3	10	9	23
M. E. Wyatt,	Conneautville,	Crawford,	-----	-----	5	-----	5
D. H. Yankey,	Altenwald,	Franklin,	2	-----	14	1	17
Arthur P. Yeatman,	Avondale,	Chester,	1	-----	3	-----	4
C. E. Young,	Williamsport,	Lycoming,	1	-----	3	1	5
D. C. Young,	Smethport,	McKean,	1	-----	-----	-----	1
D. L. Young,	Youngsville,	Warren,	-----	1	2	-----	3
W. J. Young,	Erie, Box 219,	Erie,	11	-----	60	1	72
W. B. Zacharias,	Mechanicsburg No. 3,	Cumberland,	-----	-----	1	2	3
Chas. H. Zahnizer,	Mercer,	Mercer,	-----	-----	1	-----	1
Totals,			626	418	4263	962	6269

JERSEY CATTLE.

(Registry Association).

THE AMERICAN JERSEY CATTLE CLUB.

R. M. Gow, *Secretary*, 8 West Seventeenth St., New York.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Geo. O. Albright,	Fogelsville,	Lehigh,	2	-----	13	3	18
M. W. Angle,	Rummerfield,	Bradford,	1	1	20	6	28
Mrs. Lena A. Austin,	Linesville No. 38,	Crawford,	2	-----	7	-----	9
Solomon Ballard,	Troy, R. D. No. 63,	Bradford,	-----	-----	6	-----	6
Robert Bamford,	Midway,	Washington,	1	-----	15	2	18

JERSEY CATTLE--Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Henry Barndt,	Hellertown No. 3,	Lehigh,	-----	-----	2	1	3
Leon L. Barndt & Co.,	Hellertown No. 3,	Lehigh,	1	-----	1	1	3
E. G. Barnes,	Grove City No. 11,	Mercer,	1	-----	9	-----	10
N. M. Beach,	Mansfield No. 3,	Tioga,	1	-----	14	-----	15
Walter Berger,	Blooming Glen,	Bucks,	2	1	12	2	17
R. L. Bevan,	Towanda No. 8,	Bradford,	2	-----	11	-----	13
Wm. M. Bigham's Sons,,	Gettysburg,	Adams,	2	1	8	1	12
T. H. Bines,	Stoneham,	Warren,	-----	-----	2	-----	2
A. B. Birchard,	Warren,	Warren,	-----	-----	1	-----	1
S. C. Birchard,	Birchardville,	Susquehanna,	1	3	22	9	35
S. T. Birchard,	Birchardville,	Susquehanna,	1	-----	22	3	26
Bonnyview Hall Farm,	Smithton,	Westmoreland,	2	-----	12	-----	14
A. F. Bornot,	Norristown,	Montgomery,	2	-----	13	1	16
L. A. Bourdette,	E. Smithfield No. 52,	Bradford,	-----	-----	4	-----	4
J. O. Boyer,	Finleyville,	Washington,	-----	1	7	1	9
H. W. Brenner,	Jamestown,	Mercer,	1	-----	-----	-----	1
R. M. Brodrick,	Mansfield,	Tioga,	1	-----	18	2	21
John W. Bronson,	New Galilee,	Beaver,	1	-----	8	-----	9
Howard F. Brunges,	Tunkhannock,	Wyoming,	1	-----	3	-----	4
S. P. Butler,	Dayton,	Armstrong,	1	1	4	2	8
J. S. Campbell,	Butler No. 1,	Butler,	3	2	29	12	46
Samuel Cessna,	Bedford No. 4,	Bedford,	1	2	16	2	21
J. V. Chambers & Sons,	West Alexander,	Washington,	3	2	24	15	44
F. R. Clark,	Berwick,	Columbia,	1	-----	6	-----	7
T. B. Clark,	Honesdale,	Wayne,	-----	-----	1	-----	1
J. Blaine Cloud,	Kennett Square,	Chester,	-----	-----	1	-----	1
J. N. Conyngham,	Wilkes-Barre,	Luzerne,	3	-----	51	12	66
T. S. Cooper,	Coopersburg,	Lehigh,	12	20	145	23	200
John W. Cox,	New Wilmington,	Lawrence,	1	-----	3	-----	4
N. B. Critchfield,	Stoyestown No. 1,	Somerset,	1	-----	2	-----	3
L. H. Darling,	Sugar Grove No. 3,	Warren,	-----	-----	10	-----	10
Thomas Devlin,	Langhorne,	Bucks,	2	1	40	7	50
J. O. Dewalt,	Butztown,	Northampton,	-----	-----	7	-----	7
Adam M. Diehl,	Weissport,	Carbon,	1	-----	4	1	6
H. J. Dieter,	Bradford, Box No. 1539.	McKean,	1	-----	15	-----	16
John A. Dieter,	Bradford,	McKean,	-----	-----	3	-----	3
Ervin Dieterly,	Springtown,	Bucks,	-----	-----	1	-----	1
E. M. Dowler,	Burgettstown,	Washington,	1	1	2	1	5
C. W. Duffield,	Chambersburg No. 11,	Franklin,	1	-----	5	-----	6
John W. Eckert,	Allentown,	Lehigh,	5	-----	61	-----	66
V. H. Ehrhart,	Jamestown,	Mercer,	1	-----	20	-----	21
Geo. W. Elkins, Jr.,	Abington,	Montgomery,	4	-----	43	8	55
Wm. G. Embree,	West Chester,	Chester,	2	-----	9	2	13
Samuel G Engle,	Marietta No. 2,	Lancaster,	3	2	14	6	25
W. B. Enterline & Sons,	Jamestown,	Mercer,	-----	-----	4	-----	4
S. H. Evans,	Tidioute,	Warren,	-----	-----	2	-----	2
Wm. L. Fanshawe,	Doylestown,	Bucks,	1	1	2	3	7
J. A. Farabaugh,	Ebensburg No. 1,	Cambria,	1	-----	6	2	9
W. A. Ferguson,	Chambersburg,	Franklin,	1	-----	6	-----	7
W. E. Fralie,	Lamb's Creek,	Tioga,	1	-----	6	2	9
W. L. Fullerton,	Moravia,	Lawrence,	1	1	11	-----	13
Alfred Gerhard,	Black Lick,	Indiana,	1	-----	2	1	4
W. O. Gerhard,	Weatherly No. 1,	Carbon,	1	-----	3	-----	4
W. L. Glatfelter,	Spring Forge,	York,	3	5	34	5	47
H. M. Gooderham,	Patton,	Cambria,	1	-----	-----	4	5
F. W. Gorham,	LeRaysville,	Bradford,	1	-----	3	-----	4
Clifford C. Gray,	Honesdale No. 2,	Wayne,	-----	-----	4	-----	4
L. W. Gray,	Uniontown,	Fayette,	1	-----	-----	-----	1
W. C. Hall,	Summerville,	Jefferson,	1	-----	-----	-----	1
W. A. Hamilton,	Elkin,	Indiana,	1	-----	3	-----	4
Wm. W. Harrison,	Philadelphia,	Philadelphia,	2	-----	33	-----	35
R. S. Hartley,	Pittsfield No. 1,	Warren,	7	5	25	10	47
Vallie Hawkins,	Fawn Grove,	York,	2	-----	16	-----	18
Geo. W. Helsel,	Elton,	Cambria,	-----	-----	3	2	5
Mrs. Chas. W. Henry,	Philadelphia,	Philadelphia,	1	-----	2	-----	3
Lewis B. Henson,	Coatesville,	Chester,	3	4	58	13	78

JERSEY CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. Aldus Herr,	Lancaster No. 4,	Lancaster,	2	4	22	7	35
Chas. A. Hilburn,	Easton No. 3,	Northampton,	2		14		16
Herman Hoopes,	West Chester,	Chester,	1		18	5	24
Geo. Z. Hosack,	Carnegie,	Allegheny,			2		2
Roy Huffman,	Waynesburg No. 4,	Greene,		1	5		6
W. H. Humphrey & Sons.	Portersville No. 42,	Butler,	3	1	17	7	28
H. W. Hunter,	Burgettstown,	Washington,	1		2		3
Jos. C. R. Hupp,	West Alexander,	Washington,	1				1
H. E. Jakeway,	Milan,	Bradford,	1	1	8	2	12
Charles S. Jenkins,	Lansdale,	Montgomery,	1			1	2
Jersey Queen Stock Farm,	Mifflinville,	Columbia,	1		40		41
R. E. Kendall,	Granville Summit,	Bradford,			1		1
D. J. Kenepp,	McVeytown,	Mifflin,	1		4		5
Geo. R. Kinnan,	Elkin,	Indiana,			3		3
Anselm B. Kirsch,	Nicktown,	Cambria,	2		5		7
S. T. Knox,	Altoona,	Blair,			3		3
C. A. Koontz,	Bedford,	Bedford,	1		8		9
W. A. Kuntz,	Walnutport,	Northampton,			2		2
Moses Lapp,	Gap,	Lancaster,	1		7	2	10
Max A. Lauffer,	Middletown,	Dauphin,			2		2
W. T. Lawrence,	Canton No. 72,	Bradford,	1		5		6
Samuel E. Lee,	Bedford,	Bedford,	1		3		4
M. E. Leeder,	Muncy No. 5,	Lycoming,	1		7	3	11
B. P. Leonard,	Troy,	Bradford,			8		8
Chas. A. Leonard,	Troy,	Bradford,			2		2
H. P. Lewis,	Marion Centre,	Indiana,	1		6		7
D. T. Lindley,	Canton No. 72,	Bradford,	1	3	27	6	37
H. A. Lindley,	Washington No. 6,	Washington,	1		8		9
Lingohocken Farms,	Wycombe,	Bucks,	1		4		5
R. S. Love,	Mt. Pleasant No. 1,	Westmoreland,	1		4		5
W. A. McCraney,	Canton No. 72,	Bradford,	1		19	2	22
S. U. G. McCreary,	Franklintown,	York,	1		7		8
J. W. McIntire,	Dayton No. 3,	Armstrong,	1	2	2	2	7
John B. Mackey,	Lewisville,	Chester,			1		1
Joel T. Manley,	Canton No. 72,	Bradford,	1		12		13
Frank A. Maron,	E. Stroudsburg No. 1,	Monroe,			3		3
L. O. Marshall,	Dayton,	Armstrong,			1		1
J. W. Martin & Sons,	Edinburg No. 3,	Lawrence,	2	1	9	2	14
Chas. E. Mather,	West Chester No. 6,	Chester,	1	1	7	1	10
Walter L. Matthews,	Scranton,	Lackawanna,	1		14		15
James J. Maxwell,	Quarryville,	Lancaster,	1		7		8
F. H. Meals,	Diamond,	Venango,	1		1		2
Isaac N. Messinger,	Watsontown No. 2,	Northumberland,	1	1	4	2	8
Miller & Sibley,	Franklin,	Venango,	2	3	34	6	45
John H. Mitchell,	Gwynedd Valley,	Montgomery,	1		3	2	6
John T. Morris,	Philadelphia,	Philadelphia,	1		10		11
Thomas Mott,	Canton,	Bradford,			3		3
Ed. C. Murray,	Westfield,	Tioga,	1		2		3
Geo. H. Musser,	Curtin,	Centre,			8	2	10
Fred Neamand,	Richlandtown,	Bucks,	2		10		12
S. E. Nivin,	Landenberg,	Chester,	1	1	11	3	16
A. P. Noble,	Gillett No. 58,	Bradford,	2		14		16
Isaac Norris,	Bryn Mawr,	Montgomery,	1		3	2	6
A. R. Nye & Son,	West Springfield,	Erie,			1		1
R. Brognard Okie,	Devon,	Chester,			3		3
C. O. Opp,	Muncy,	Lycoming,	1		1	9	11
G. E. Osburn,	Stoneboro No. 21,	Mercer,			4		4
M. W. Palmer,	Kingsley,	Susquehanna,	1		48	6	55
Penna. State College,	State College,	Centre,				1	1
Penna. Training School,	Morganza,	Washington,	5	5	58	14	82
Penshurst Farm,	Narberth,	Montgomery,	3	8	39	17	67
W. E. & J. J. Perham,	Pleasant Mount,	Wayne,			6		6
E. F. Perschke,	New Castle No. 6,	Lawrence,	1				1
R. B. Plumly,	Lincoln University,	Chester,			2		2
Eri H. Powley,	Oxford,	Chester,	1		1		2
Morris Reichenbach,	Coopersburg,	Lehigh,	1		1	1	3

JERSEY CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Henry S. Rerfield,	Millerton,	Tioga,	4	-----	42	-----	46
E. A. Reynolds,	Meadville, R. No. 1,	Crawford,	1	-----	1	-----	2
G. H. Reynolds,	Alba,	Bradford,	1	3	28	3	35
J. D. Richards,	Manorville,	Armstrong,	1	-----	4	1	6
J. M. Risinger,	Homer City,	Indiana,	-----	-----	5	1	6
Elmer M. Ritter,	Chambersburg No. 5,	Franklin,	1	-----	5	2	8
F. H. Rockwell,	Warren,	Warren,	-----	-----	4	-----	4
V. F. Rohm,	Hopewell,	Bradford,	1	1	3	1	6
L. M. Roth,	Prospect,	Butler,	1	2	7	1	11
Fred G. W. Runk,	Allentown,	Lehigh,	2	-----	5	-----	7
F. A. Scheirer,	Slatington,	Lehigh,	2	-----	7	-----	9
A. G. Shaffer,	Shelocta No. 1,	Indiana,	1	-----	5	-----	6
R. F. Shannon,	Pittsburgh,	Allegheny,	5	20	80	-----	105
Freeman Shaw,	Mansfield,	Tioga,	1	2	11	1	15
B. Luther Shimer,	Bethlehem,	Lehigh,	1	-----	2	-----	3
W. F. Shrum,	Jeannette No. 2,	Westmoreland,	1	-----	39	-----	40
Jos. C. Sibley,	Franklin,	Venango,	1	-----	14	-----	15
J. H. Silvis,	Greensburg No. 3,	Westmoreland,	1	1	5	3	10
A. C. Slifer,	Woodward,	Centre,	1	-----	5	-----	6
Clayton Smith,	Bedford No. 4,	Bedford,	1	-----	3	-----	4
G. E. Smith,	Mercer,	Mercer,	-----	-----	1	-----	1
G. Smith & Sons,	Seelyville,	Wayne,	1	1	11	8	21
D. H. Somerville,	Chest Springs,	Cambria,	2	1	2	1	6
State Livestock Sanitary Board Farm.	Media,	Delaware,	1	-----	2	-----	3
John F. Steel,	Pittsburgh,	Allegheny,	-----	-----	5	1	6
Steele Brothers,	Glen Moore,	Chester,	1	-----	11	-----	12
S. Brooke Stoner,	Muddy Creek Forks,	York,	1	-----	11	-----	12
Thad Stephens,	Red Hill,	Montgomery,	1	-----	1	-----	2
Thos. E. Stevens,	Towanda,	Bradford,	1	-----	4	-----	5
W. W. Stewart,	Library,	Allegheny,	1	-----	12	5	18
Jos. Thayer,	Linesville,	Crawford,	1	-----	7	-----	8
James Thomas,	Williamsport,	Lycoming,	-----	-----	4	-----	4
Frank B. Thompson,	New Wilmington,	Lawrence,	2	3	36	8	49
Wm. D. Turrell,	Birchardville,	Susquehanna,	1	-----	24	9	34
John L. VanHorn,	Troy No. 67,	Bradford,	1	3	4	1	9
Leon O. VanNoy,	Troy No. 66,	Bradford,	2	-----	20	-----	22
J. C. Valentine,	Coatesville No. 5,	Chester,	2	3	19	10	34
Valley Brook Farm,	Downingtown,	Chester,	1	-----	11	2	14
H. G. Von Wolffradt,	Milan No. 22,	Bradford,	1	-----	11	-----	12
W. F. Wagner,	Harrison City,	Westmoreland,	1	-----	13	-----	14
Edward Walter,	West Chester,	Chester,	1	-----	11	-----	12
Wm. J. Watterson,	Indiana No. 1,	Indiana,	1	-----	2	-----	3
C. M. Webster,	Mansfield,	Tioga,	-----	-----	3	-----	3
D. F. Wells,	Wyalusing,	Bradford,	1	-----	15	-----	16
E. L. Weston,	Kingsley No. 2,	Susquehanna,	-----	-----	3	1	4
Geo. D. Widener,	Elkins Park,	Montgomery,	1	4	25	9	39
Jas. S. Wilkes,	Stevensville,	Bradford,	-----	-----	1	-----	1
Williamson Free School of Mechanical Trades.	Williamson School,	Delaware,	2	-----	34	-----	36
Jennie Wolfe,	Sewickley Heights No. 2.	Allegheny,	1	-----	2	-----	3
G. E. Wright,	Aspers,	Adams,	1	-----	2	-----	3
Jas. B. Wylie,	Washington,	Washington,	1	1	9	1	12
Geo. Yonkers,	Elk City,	Clarion,	1	-----	4	1	6
A. P. Young,	Millville, R. D.,	Columbia,	1	-----	9	3	13
D. M. Young,	Milan,	Bradford,	-----	-----	1	-----	1
Totals,			222	131	2160	343	2856

POLLED DURHAM CATTLE.

(Registry Association).

THE POLLED DURHAM BREEDERS' ASSOCIATION.

J. H. Martz, *Secretary*, Greenville, O.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Beriah Ball,	Stoneboro No. 1,	Mercer,	1				1
J. S. Barkman,	Rockwood,	Somerset,	1		1		2
Chas. Buchanan,	Cariton,	Mercer,	1		3		4
F. F. Collins,	Cooperstown No. 1,	Venango,	1		1		2
Albert DeFrance,	Sandy Lake,	Mercer,	1	1	17	6	25
J. B. Hemminger,	Somerset No. 4,	Somerset,	2		6		8
Mrs. Salome E. Hemminger.	Somerset No. 4,	Somerset,		1	2		3
T. M. Johnston,	Cochranton,	Crawford,			1		1
J. B. Porter,	Clintonville,	Venango,	1				1
Lee R. Scott,	Burgettstown,	Washington,	3	6	14	6	29
Totals,			11	8	45	12	76

RED POLLED CATTLE.

(Registry Association).

RED POLLED CATTLE CLUB OF AMERICA.

H. A. Martin, *Secretary*, Gotham, Wis.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
N. O. Brownlee,	Crothers,	Washington,	1		4	1	6
J. N. Byler,	Belleville,	Mifflin,	1		8		9
E. W. Cooper,	Falls Creek, R. D. No. 1.	Jefferson,			3		3
J. C. Dickson,	Cochranton No. 66,	Crawford,	3	5	11	3	22
John F. Dobler,	Girard,	Erie,	1	2	49	4	56

RED POLLED CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Harry L. Eiehar,	Greensburg No. 5,	Westmoreland,	1	-----	2	-----	3
C. C. Fleming,	Clarion,	Clarion,	1	-----	-----	-----	1
C. Y. Noble,	Cabot,	Butler,	1	-----	-----	-----	1
F. M. Preston,	Columbus,	Warren,	1	-----	3	-----	4
A. R. Putnam,	Troy,	Bradford,	-----	-----	2	-----	2
Llewellyn Riehards,	New Millford No. 1,	Susquehanna,	-----	1	10	2	13
Harvey A. Rumsey,	Westfield No. 1,	Tioga,	1	-----	4	-----	5
M. H. Sayman,	Dushore, R. No. 3,	Sullivan,	-----	1	-----	-----	1
Ernest C. Smith,	Meadville No. 9,	Crawford,	1	-----	1	-----	2
E. D. Stebbins,	Warren No. 3,	Warren,	1	-----	-----	-----	1
D. L. Stevens,	Uniondale,	Susquehanna,	-----	1	6	1	8
Jas. R. Stewart,	Hookstown,	Beaver,	1	1	6	1	9
O. H. Swogger & Son,	Mercer,	Mereer,	5	3	8	1	17
L. E. Thompson,	Wellsboro,	Tioga,	1	2	2	-----	5
W. B. Vogus,	Emlenton No. 5,	Venango,	1	-----	-----	-----	1
Chas. P. Wagner,	Evans City No. 33,	Butler,	1	-----	2	-----	3
Hiram Worley,	Mereer No. 2,	Mereer,	2	3	4	2	11
Totals,			24	19	125	15	183

SHORT HORN CATTLE.

(Registry Association).

AMERICAN SHORT-HORN BREEDERS' ASSOCIATION.

John W. Groves, *Secretary*, Chicago, Ill.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Frank Akeley,	Russell,	Warren,	1	-----	1	-----	2
B. C. Albro,	Corry, R. D. No. 9,	Erie,	1	-----	14	-----	15
Emal Anderson Bros.,	Pittsfield, R. D. No. 1.	Warren,	1	-----	2	1	4
J. R. Andrews,	Adamsville,	Crawford,	1	-----	2	-----	3
Wm. H. Andrews,	Conneaut Lake,	Crawford,	1	-----	5	2	8
Russel Ankney,	Rector,	Westmoreland,	1	1	3	1	6
D. N. App,	Selinsgrove,	Snyder,	2	1	5	-----	8
Geo. Ashbridge,	Whitford,	Chester,	1	1	1	-----	3
Benj. B. Baird,	MeClellandtown,	Fayette,	1	-----	7	-----	8

SHORT HORN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Jos. Barron,	Slippery Rock No. 57.	Butler,		3	3		6
H. A. Barton,	Murdocksville,	Washington,			2		2
Wm. C. Black,	Mercer, Route No. 6,	Mercer,	1	3	9	1	14
Fred Bohlayer,	Troy,	Bradford,	1	2	4	2	9
H. E. Bollard,	Linesville,	Crawford,			1		1
C. M. Boyd,	Grove City,	Mercer,		1	1		2
D. E. Boylan and C. F. Rath.	Hadley, R. D. No. 3.	Mercer,	1				1
J. W. Boyles,	Lawsonham No. 1, Box 31.	Clarion,			4		4
Frank S. Brace,	Columbia X Roads,	Bradford,	3	7	22	8	40
Chas. Buchanan,	Carlton,	Mercer,	1		3		4
S. W. Burleson,	Albion,	Erie,	2	2	20	4	28
Dean Burley,	Columbia X Roads, No. 59.	Bradford,			1	2	3
W. L. Byers,	Mount Pleasant,	Westmoreland,	1	3	5	3	12
E. C. Campbell,	Linesville,	Crawford,			1		1
E. M. Campbell,	Greenville,	Mercer,	1	3	14	4	22
J. W. Carothers,	Burgettstown,	Washington,			1		1
A. B. Carr,	Saegerstown,	Crawford,			6		6
J. N. Cheers,	Titusville, R. D. No. 79.	Crawford,	1		4	1	6
W. L. Childs,	Townville,	Crawford,	1	1	2	1	5
W. G. Christley,	Mercer,	Mercer,		2	18	6	26
Herman Clabaugh,	Chapman's Run,	Bedford,	1				1
Cleveland Bros.,	Mansfield,	Tioga,	1		2		3
G. W. Coffey,	Washington,	Washington,	1	2	10	2	15
Thos. Cooper,	East Brook,	Lawrence,			5		5
Leo L. Cornish,	Bear Lake,	Warren,	1		2		3
Wm. Cosgrove,	New Galilee, R. D. No. 3.	Lawrence,	1		4	3	8
John A. Coulter,	Grove City,	Mercer,	1				1
Edwin G. Cutler,	Crossingville,	Crawford,	1				1
A. P. Darr,	Greensburg,	Westmoreland,	2		3		5
G. G. Davis,	Glen Hope,	Clearfield,	1		1		2
Geo. W. Deeds,	Ligonier,	Westmoreland,	1	2	13	3	19
Albert DeFrance,	Sandy Lake,	Mercer,	1	1	17	6	25
B. S. Detrick,	Sugar Run,	Bradford,	1		4		5
Detrick Bros.,	North Girard,	Erie,	1		1		2
Mrs. D. F. Diener,	Brookville,	Jefferson,	1				1
F. W. Dodds,	Volant,	Lawrence,	1	1	1	1	4
R. E. Donham,	Greensboro, R. No. 1,	Greene,			2		2
F. S. Dunlap,	Newville,	Cumberland,	1	1	6	2	10
T. W. & J. A. Eberle,	Mercer,	Mercer,	1	2	3	2	8
John B. Eisiminger,	Waynesburg, R. No. 3.	Greene,			1		1
Lazear Eisiminger,	Waynesburg, R. No. 3.	Greene,			1		1
L. E. Elliott,	Mercersburg,	Franklin,	1	1	7	1	10
Asa S. Ennis,	Standing Stone,	Bradford,	1		1	1	3
M. L. Fausold,	Latrobe,	Westmoreland,		1	3	2	6
C. H. Firth,	Sugar Grove,	Warren,	1				1
T. A. Firth,	Sugar Grove,	Warren,			1		1
S. P. Fogelman,	Dewart,	Northumberland,	1				1
Geo. M. Forney,	Hanover,	York,	4	2	4	2	12
W. S. Gill,	Sharpsville,	Mercer,	1				1
F. W. Gilson,	Mercer, R. No. 6,	Mercer,	1		7		8
Geo. K. Gilson,	Grove City,	Mercer,			2		2
W. H. Gnagey,	Meyersdale,	Somerset,		1	2	2	5
John G. Graham,	Spruce Hill,	Juniata,	1				1
Wm. B. Graham,	New Florence, R. No. 1.	Westmoreland,			2		2
Geo. Greer,	New Castle,	Lawrence,	3	3	13	2	21
I. O. Grimes,	Claysville, R. No. 3,	Washington,	1	1	5		7
J. Stuart Groupe,	Rauchtown,	Clinton,	1	1	9	6	17
G. S. Hanlin,	Hanlin Station,	Washington,	1	1	7	5	14
J. D. Harnish,	Waterstreet,	Huntingdon,	1		3		4

SHORT HORN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
John R. Harrington,	Albion,	Erie,	-----	-----	2	-----	2
F. H. Hartman,	Lawsonham,	Clarion,	1	-----	3	2	6
H. H. Hawbaker,	Greencastle,	Franklin,	-----	-----	4	-----	4
C. A. Hershey,	Tillie,	Adams,	6	3	12	1	22
A. B. Hoffman,	Somerset, R. No. 6,	Somerset,	-----	-----	1	-----	1
L. R. Hotchkiss,	West Springfield,	Erie,	1	-----	7	-----	8
J. H. Houston,	Mercer,	Mercer,	1	3	7	-----	11
W. S. Hughes,	Bristoria,	Greene,	1	3	12	4	20
Matthew Hunter,	East Brook, R. No. 1.	Lawrence,	1	1	2	1	5
W. L. Inghram,	Waynesburg,	Greene,	1	-----	-----	-----	1
Isaac Guldin Irey,	Douglasville,	Berks,	1	2	4	8	15
J. C. Jenkins,	Wampum,	Lawrence,	1	-----	6	4	11
Frank Joslin,	Springboro,	Crawford,	1	-----	3	-----	4
J. P. Kammerdiener,	Mosgrove, R. No. 2,	Armstrong,	1	-----	1	-----	2
Peter Kammerdiener,	Echo,	Armstrong,	1	1	6	2	10
E. S. Kauffman,	Lititz, R. No. 3,	Lancaster,	1	-----	2	-----	3
C. M. Kennedy,	Ulster,	Bradford,	1	-----	10	-----	11
S. B. Kilmer,	Dushore,	Sullivan,	1	-----	7	-----	8
E. W. Kline,	Orangeville, R. No. 1,	Columbia,	1	-----	-----	-----	1
T. E. Knapp,	Saegerstown,	Crawford,	-----	-----	1	-----	1
D. H. Lefever,	Meadville, R. No. 2,	Crawford,	-----	-----	1	-----	1
C. H. Lemley,	Mt. Morris,	Greene,	1	-----	-----	-----	1
K. B. Lenhart,	Confluence,	Somerset,	1	-----	-----	-----	1
W. E. & G. H. Ligo,	Volant, R. No. 64,	Lawrence,	-----	-----	3	-----	3
Benj. Limbert,	Spring Mills,	Centre,	1	-----	2	-----	3
E. M. Lowe,	Sugar Grove,	Warren,	-----	-----	1	-----	1
J. L. Luse,	Clarksville,	Greene,	1	-----	3	-----	4
O. B. McCall,	Parkers Landing,	Clarion,	1	1	4	2	8
J. H. McClure,	New Wilmington,	Lawrence,	1	-----	-----	-----	1
C. F. McCollough,	Chicora,	Butler,	1	-----	3	-----	4
F. W. & W. A. McCoy,	Mercer,	Mercer,	-----	1	9	2	12
T. A. McCoy,	Mercer, R. No. 8,	Mercer,	1	-----	4	-----	5
D. F. McDowell,	Fredonia,	Mercer,	-----	1	2	1	4
J. F. McDowell & Son,	Hickory,	Washington,	1	-----	8	-----	9
W. C. McGeorge,	New Galilee,	Beaver,	1	-----	6	-----	7
P. C. McGuire,	Barronvale,	Somerset,	1	1	3	-----	5
C. M. McMeen,	East Waterford No. 2,	Juniata,	2	-----	6	2	10
D. M. Marshall,	Nook,	Juniata,	1	-----	-----	-----	1
J. Willis Martin,	Washington, R. No. 2.	Washington,	1	1	2	-----	4
W. C. Martin,	Volant, R. No. 1,	Lawrence,	1	-----	-----	-----	1
W. M. Mason,	Saegerstown,	Crawford,	-----	-----	2	-----	2
Jefferson Mattacks,	Geneva,	Crawford,	1	-----	3	1	5
Geo. B. Matterson,	Centreville,	Crawford,	1	-----	-----	-----	1
D. W. Maust,	Springs,	Somerset,	-----	1	4	-----	5
May & Otis,	Granville Centre,	Bradford,	9	22	77	13	121
Austin Meals,	West Sunbury,	Butler,	1	-----	-----	-----	1
Geo. W. Meals,	West Sunbury, R. No. 49.	Butler,	1	-----	-----	-----	1
A. A. Miller,	Mercer,	Mercer,	1	-----	2	-----	3
W. J. Monroe,	Greensburg, R. No. 3,	Westmoreland,	1	1	4	1	7
J. H. Morrow,	Karns City, R. No. 74.	Butler,	1	1	4	-----	6
W. H. Mosier,	Springboro,	Crawford,	1	2	5	1	9
Carl F. Norbeck,	Sugar Grove,	Warren,	-----	-----	1	-----	1
J. T. Park,	Marion Center,	Indiana,	-----	-----	5	-----	5
C. L. & F. M. Patterson,	Rea, R. No. 2,	Washington,	2	-----	8	-----	10
H. G. Peck,	Springs,	Somerset,	-----	1	1	1	3
Jonas M. Peck,	Springs,	Somerset,	1	-----	3	1	5
J. W. Peck,	Meyersdale,	Somerset,	1	-----	7	-----	8
Penn'a State College,	State College,	Centre,	1	-----	19	-----	20
Pfeil Bros.,	New Castle,	Lawrence,	1	-----	-----	-----	1
C. T. Polliard,	New Bethlehem,	Clarion,	1	2	8	2	13
W. W. Pool & Son,	Stoneboro,	Mercer,	1	-----	8	1	10
H. C. Porter,	Media, R. No. 3,	Delaware,	1	-----	-----	-----	1
Post Bros.,	West Alexander,	Washington,	1	4	12	2	19

SHORT HORN CATTLE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Xeno W. Putnam,	Harmonsburg,	Crawford,	1	4	11	2	18
H. B. Randall,	Union City,	Erie,	1	1	4	2	8
E. A. Rankin,	Conneaut Lake,	Crawford,	1	1	4	1	7
Frank P. Rankin,	Brookville,	Jefferson,	1		6	4	11
S. J. Ringler,	Elk Lick,	Somerset,	1		4	3	8
H. G. Ritchey,	Warrior's Mark,	Huntingdon,	3	1	2	2	8
I. A. Rockwell,	Troy, R. No. 66,	Bradford,	1		2		3
J. L. Rockwell,	Troy, R. No. 66,	Bradford,	1		15		16
Clarence E. Royer,	McEwensville,	Northumberland,	1				1
Fred A. Saxton,	Granville Center,	Bradford,		2	3	2	7
J. C. Sayler,	Somerset,	Somerset,	2	4	9	2	17
John P. Sayler,	Meyersdale,	Somerset,	1		7		8
P. S. Sayler,	Somerset,	Somerset,	2	4	14	5	25
Wm. J. Schmidt,	Honesdale,	Wayne,	1				1
J. F. Schramm,	Fombell,	Beaver,	1				1
Jas. J. Scott,	Towanda,	Bradford,	1		2	1	4
Lee R. Scott,	Burgettstown,	Washington,	3	6	18	6	33
L. W. Seigworth,	Parkers Landing,	Clarion,	1		3		4
H. H. Seley,	Geneva,	Crawford,			2		2
Harlow D. C. Shuster,	New Galilee,	Beaver,	1		6		7
Clinton Skinner,	Dry Run,	Franklin,			2		2
M. E. Slater,	Clark's Mills,	Mercer,			3		3
S. S. Sollenberger,	Chambersburg No. 12,	Franklin,	4		12		16
J. W. Spillman,	Dunn's Station No. 3,	Washington,	1		4		5
Sprowls & Slemmons,	Claysville, R. No. 6,	Washington,	1		9		10
Solomon Stamm,	Evan City,	Butler,	1		7		8
Jabez H. Stevens,	Standing Stone,	Bradford,	1	1	1		3
F. S. Stewart,	New Bethlehem, R. No. 1,	Clarion,			3		3
Mrs. S. C. Stewart,	Lawsonham,	Clarion,		1	2	1	4
S. C. Stewart,	Lawsonham,	Clarion,		1	5	1	7
J. L. Stouffer,	Southwest P. O.,	Westmoreland,	2	2	5	3	12
John C. Strange,	Mansfield,	Tioga,			2		2
Clinton Streby,	Overton,	Bradford,	1		10		11
Geo. G. Strosnider,	Waynesburg, R. No. 3,	Greene,	1		9		10
J. C. Sturgeon,	Kittanning, R. No. 4,	Armstrong,	1		3		4
W. J. Sturgeon,	Kittanning,	Armstrong,	1	2	9	2	14
F. B. Tait,	Mercer, R. No. 2,	Mercer,			4	2	6
G. S. Tait,	Fredonia,	Mercer,		1		1	2
J. B. Tait,	Fredonia,	Mercer,	1	3	8	1	13
Meade Thomas,	Alba,	Bradford,	3	5	6		14
John S. Thompson,	Pittsfield, R. No. 1,	Warren,			2		2
W. M. Thompson,	Uniontown,	Fayette,	5	2	20	4	31
Edwin E. Tiffany,	Brooklyn,	Susquehanna,			1		1
Jos. B. Twining,	Gettysburg,	Adams,	1		2	1	4
R. C. Vance,	Burgettstown,	Washington,	1	2	8	7	18
C. G. Wagner,	Westford,	Crawford,	1		7		8
E. P. Walls,	Lawsonham,	Clarion,	1		2		3
H. W. Warren,	Forksville, R. No. 1,	Sullivan,	1		3		4
D. E. Watson,	Rutland,	Tioga,	1		2		3
Robert S. Watters & Sons,	Ellwood City,	Lawrence,	1	4	7	1	13
A. N. Womelsdorf,	Millhall,	Clinton,	1				1
Richard G. Wood,	Conshohocken,	Montgomery,	3	2	27	7	39
Amos Young,	West Sunbury,	Butler	1		4		5
C. Zeisenheim & Son,	North Girard,	Erie,	2	2	9	4	17
Totals,			184	153	933	193	1463

BLACK FACE HIGHLAND SHEEP.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. C. Dickson,	Cochranton,	Crawford,	2	-----	4	-----	6

CHEVIOT SHEEP.

(Registry Association).

AMERICAN CHEVIOT SHEEP SOCIETY.

F. E. Dawley, *Secretary*, Fayetteville, N. Y.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. C. Dickson,	Cochranton,	Crawford,	3	-----	3	-----	6
Fern Wood Stock Farm,	Stoneboro No. 22,	Mercer,	1	2	8	1	12
L. D. M. Hatton,	Cochranville,	Chester,	2	1	10	5	18
S. V. McDowell & Sons,	Fredonia,	Mercer,	1	1	6	5	13
Totals,			7	4	27	11	49

COTSWOLD SHEEP.

(Registry Association).

AMERICAN COTSWOLD REGISTRY ASSOCIATION.

F. W. Harding, *Secretary*, Waukesha, Wis.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
R. S. Love,	Mt. Pleasant No. 1,	Westmoreland,	1	-----	4	-----	5
D. F. McDowell,	Fredonia,	Mercer,	2	1	11	4	18
S. V. McDowell & Sons,	Fredonia,	Mercer,	3	4	13	4	24
Penn'a State College,	State College,	Centre,	-----	-----	1	-----	1
Totals,			6	5	29	8	48

DORSET SHEEP.

(Registry Association).

THE CONTINENTAL DORSET CLUB.

Jos. E. Wing, *Secretary*, Mechanicsburg, O.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
B. D. Anderson,	Industry,	Beaver,	1	-----	6	-----	7
Jos. Barron,	Slippery Rock No. 57,	Butler,	1	-----	5	-----	6
H. A. Barton,	Murdocksville,	Washington,	1	-----	6	-----	7
Walter A. Collins,	Morrisville No. 1,	Bucks,	1	-----	1	-----	2
R. R. Cowden,	Rea No. 2,	Washington,	1	4	4	3	12
Geo. W. Deeds,	Ligonier,	Westmoreland,	1	-----	5	-----	6
J. B. Henderson,	Burgettstown,	Washington,	3	27	130	20	180
F. W. & W. A. McCoy & Sons.	Mercer,	Mercer,	1	1	12	-----	14
W. T. McCoy,	Mercer,	Mercer,	1	-----	6	-----	7

DORSET SHEEP—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
W. E. Matthews,	Johnstown,	Cambria,	2	2	8	4	16
H. L. Molyneux,	Forksville,	Sullivan,	1	-----	-----	-----	1
John L. Painter,	West Newton,	Westmoreland,	1	-----	-----	-----	1
S. Shaffer,	New Castle,	Lawrence,	1	4	10	6	21
J. H. Shattuck,	Erie,	Erie,	1	-----	2	-----	3
S. G. Snodgrass,	Taylorstown,	Washington,	1	-----	-----	-----	1
Stegmaier Farm,	Trucksville,	Luzerne,	1	-----	7	-----	8
James B. Wylie,	Washington,	Washington,	4	-----	50	-----	54
Totals,			23	38	252	33	346

HAMPSHIRE-DOWN SHEEP.

(Registry Association).

AMERICAN HAMPSHIRE SHEEP ASSOCIATION.

Comfort A. Tyler, *Secretary*, Coldwater, Mich.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
E. D. Allen,	Harford,	Susquehanna,	1	-----	4	3	8
H. W. Allison,	Mercer,	Mercer,	3	11	20	8	42
J. H. Allison,	Mercer,	Mercer,	1	14	21	12	48
Jos. Barron,	Slippery Rock No. 57,	Butler,	4	2	10	2	18
Jas. Blair,	Hartstown,	Crawford,	2	-----	19	-----	21
G. A. Carpenter,	Manns Choice,	Bedford,	1	-----	3	-----	4
J. C. Dickson,	Cochranton,	Crawford,	3	-----	6	-----	9
J. L. Mason,	Hartstown,	Crawford,	2	2	5	3	12
J. F. Monroe,	Troy,	Bradford,	1	-----	16	-----	17
W. J. Monroe,	Greensburg No. 3,	Westmoreland,	1	-----	6	-----	7
O. D. Patterson,	Covington,	Tioga,	1	4	18	4	27
James Phipps,	Mercer,	Mercer,	7	3	16	4	30
L. E. Thompson,	Wellsboro No. 8,	Tioga,	8	-----	62	-----	70
M. A. Thompson,	Wellsboro No. 9,	Tioga,	1	-----	8	-----	9
A. L. Tipple,	Wellsboro,	Tioga,	1	-----	17	-----	18
Totals,			37	36	231	36	340

LEICESTER SHEEP.

(Registry Association).

AMERICAN LEICESTER BREEDERS' ASSOCIATION.

A. J. Temple, *Secretary*, Cameron, Ill.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. Harlan Frantz,	Waynesboro,	Franklin,	-----	-----	2	-----	2
F. W. & W. A. McCoy & Sons,	Mercer,	Mercer,	2	-----	9	6	17
F. B. Tait,	Mercer No. 2,	Mercer,	-----	-----	2	-----	2
Totals,			2	0	13	6	21

LINCOLN SHEEP.

(Registry Association).

NATIONAL LINCOLN SHEEP BREEDERS' ASSOCIATION.

Bert Smith, *Secretary*, Charlotte, Mich.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Jos. Barron,	Slippery Rock No. 57,	Butler,	2	2	5	2	11
H. H. Hawbaker,	Greencastle,	Franklin,	2	-----	3	-----	5
Totals,			4	2	8	2	16

MERINO SHEEP.

(Registry Associations).

DICKINSON MERINO SHEEP RECORD CO.

Beulah McDowell Miller, *Secretary*, Canton, Ohio.

NATIONAL DELAINE MERINO SHEEP BREEDERS' ASSOCIATION.

J. B. Johnson, *Secretary*, Canonsburg, Pa.

AMERICAN AND DELAINE MERINO RECORD ASSOCIATION.

S. M. Cleaver, *Secretary*, Delaware, Ohio.

INTERNATIONAL VON HOMEYER RAMBOUILLET CLUB.

E. N. Ball, *Secretary*, Ann Arbor, Mich.

MICHIGAN MERINO SHEEP BREEDERS' ASSOCIATION.

E. N. Ball, *Secretary*, Ann Arbor, Mich.

VERMONT, NEW YORK AND OHIO MERINO SHEEP BREEDERS' ASSOCIATION.

Wesley Bishop, *Secretary*, Delaware, Ohio. R. D.

AMERICAN RAMBOUILLET SHEEP BREEDERS' ASSOCIATION.

Dwight Lincoln, *Secretary*, Milford Center, Ohio.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
H. A. Allman,	Coal Center No. 1,	Washington,	2	3	31	4	40
W. E. Anderson,	West Alexander,	Washington,	8	-----	50	-----	58
Jos. Barron,	Slippery Rock No. 57,	Butler,	20	9	105	28	162
Biddle & Patterson,	Carmichaels,	Greene,	26	4	47	17	94
S. F. Braddock,	West Finley,	Washington,	1	3	10	5	19
Ira A. Cleaver,	West Brownsville No. 1.	Washington,	8	-----	65	-----	73
J. C. Cole,	Waynesburg No. 4,	Greene,	4	4	22	4	34
Chas. E. Crothers,	Taylorstown,	Washington,	24	35	80	28	167
Howard N. Day,	Dunns Station No. 3,	Washington,	5	9	28	6	48
Lawrence V. Elliott,	Fayette City No. 22,	Fayette,	5	4	50	20	79
J. H. Hamilton,	Canonsburg No. 2,	Washington,	1	-----	99	-----	100
R. D. Hamilton,	Canonsburg,	Washington,	15	5	70	10	100
M. M. Keener,	Slippery Rock No. 57,	Butler,	10	-----	40	-----	50
W. C. McDonnell,	Hanlin Station,	Washington,	10	-----	20	-----	30
A. S. McQuilkin,	Dayton,	Armstrong,	-----	-----	3	-----	3
E. D. Mapel & Son,	Waynesburg No. 4,	Greene,	13	3	15	2	33
E. D. Mapel,	Waynesburg,	Greene,	6	4	16	2	28

MERINO SHEEP—Continued.

NAME.	ADDRESS.	COUNTY	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
H. H. Mapel,	Waynesburg No. 5,	Greene,	5	-----	25	6	36
E. P. Mollenauer,	Canonsburg No. 5,	Washington,	2	6	12	3	23
Milton O. Moore,	Washington,	Washington,	4	12	37	18	71
T. B. Narigon & Son,	West Alexander,	Washington,	9	9	26	9	53
Wm. Orndoff,	Rogersville,	Greene,	1	1	-----	-----	2
Geo. G. Paxton,	Houston,	Washington,	6	-----	70	10	86
Penn'a State College,	State College,	Centre,	4	-----	21	2	27
Elmer L. Rutan,	Dunns Station,	Washington,	25	-----	75	-----	100
Lee R. Scott,	Burgettstown,	Washington,	10	11	78	29	128
Sprowls & Slemmons,	Claysville No. 6,	Washington,	7	5	41	4	57
James R. Stewart,	Hookstown,	Beaver,	6	2	43	13	64
J. W. Stewart,	Jefferson,	Greene,	2	-----	10	-----	12
R. Wylie & Son,	Washington,	Washington,	-----	-----	25	-----	25
RAMBOUILLET (French Merino).							
Jos. Barron,	Slippery Rock No. 57,	Butler,	8	12	35	16	71
W. H. John,	Troy,	Bradford,	1	-----	30	-----	31
Pettit Bros.,	Burgettstown,	Washington,	7	-----	18	-----	25
C. M. Wood,	Knoxville,	Tioga,	2	-----	13	-----	15
Totals,			257	141	1310	236	1944

OXFORD DOWN SHEEP.

(Registry Association).

AMERICAN OXFORD DOWN RECORD ASSOCIATION.

W. A. Shafer, *Secretary*, Hamilton, Ohio.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
W. H. Broadbent,	Volant No. 65,	Mercer,	6	3	10	4	23
Robert George,	Indiana No. 5,	Indiana,	1	-----	4	-----	5
Geo. A. Hogg,	Pittsburgh,	Allegheny,	2	-----	-----	-----	2
Jas. A. McKean,	Smethport,	McKean,	1	-----	-----	-----	1
A. G. Shaffer,	Shelocta No. 1,	Armstrong,	-----	-----	5	-----	5
O. H. Swogger & Son,	Mercer,	Mercer,	3	3	9	3	18
Totals,			13	6	28	7	54

SHROPSHIRE SHEEP.

(Registry Association).

AMERICAN SHROPSHIRE REGISTRY ASSOCIATION.

J. M. Wade, *Secretary*, Lafayette, Ind.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
E. D. Allen,	Harford,	Susquehanna,	1		9	5	15
Jos. Barron,	Slippery Rock No. 57,	Butler,	1		4	1	6
Frank S. Bissell,	Pittsburgh,	Allegheny,	1		1		2
T. J. Bryan,	Karns City,	Butler,		1	5	1	7
W. H. Buchanan,	Home,	Indiana,			5		5
J. W. Bunnell,	Montrose No. 1,	Susquehanna,	1	2	12	1	16
John W. Burket,	Tyrone No. 1,	Blair,		7	13	1	21
O. S. Burnham,	Strattonville,	Clarion,	1		2	2	5
R. L. Bush,	Montrose,	Susquehanna,	1				1
Fred W. Card,	Sylvania,	Bradford,	1		7		8
Eros H. Carpenter,	Eldred,	McKean,	1		2	1	4
E. B. Cassatt,	Berwyn,	Chester,	8		106		114
A. H. Conklin,	S. Montrose,	Susquehanna,	1	2	6	2	11
Jos. O. Cowl,	Troy,	Bradford,	1		1		2
J. C. Dickson,	Cochranton,	Crawford,	2		2		4
Wm. F. Dreer,	Rosemont,	Delaware,	5		48		53
F. S. Dunlap,	Newville No. 1,	Cumberland,	1		14		15
G. W. Elkin,	Elkin Park,	Montgomery,	2		26	10	38
M. L. Everitt,	Millerton,	Tioga,	1		2		3
Jos. T. Fleming,	Belleville,	Mifflin,		1	10	3	14
D. H. Ford,	Wellsboro,	Tioga,		4	8	6	18
J. A. Fox,	Raymilton,	Venango,	1		2		3
L. Gerwick,	Emlenton,	Venango,	1				1
Aker G. Glenn,	Garmans Mills No. 1,	Cambria,	3	2	22	1	28
Bert Harris,	Linesville,	Crawford,			1		1
W. B. Hemphill,	Coudersport,	Potter,	1		10		11
J. I. Hereter,	Gettysburg,	Adams,		2	9	3	14
C. A. Hershey,	Tillie,	Adams,	1	1	10		12
Milo E. Holmes,	Murdocksville,	Washington,	1				1
Herman Hoopes,	West Chester,	Chester,	1		16		17
Harry H. Horton,	Sheffield,	Warren,	3	2	17	6	28
E. V. Hunt,	Wyalusing,	Bradford,	1		1		2
J. E. Johnson,	Stoyestown,	Somerset,	1		3	2	6
D. W. Jones,	Wilmore,	Cambria,	1		5	3	9
D. S. Kloss,	Tyrone,	Blair,	1		20		21
C. E. Kemmerer,	Bethlehem No. 1,	Northampton,	1		3		4
C. M. Kennedy,	Ulster,	Bradford,	2		2		4
J. F. Lantz & Co.,	West Chester,	Chester,	5	6	35	10	56
Henry Love & Son,	N. Mehoopany,	Wyoming,	2	6	9	4	21
C. W. Lovelass,	Fallsdale,	Wayne,	1		6		7
Hugh P. Lewis,	Marion Center,	Indiana,	1		7	1	9
Thos. McCoy & Son,	Volant No. 1,	Lawrence,	1	7	21	4	33
J. W. McIntire,	Dayton No. 3,	Armstrong,	2	3	21	4	30
John McNamara,	Little Meadows,	Susquehanna,	1				1
E. W. Merrill,	Erie,	Erie,	1		24		25
A. A. Miller,	Mercer,	Mercer,	2	1	22	8	33
Robert Moore,	Glen Moore,	Chester,	4	6	30	10	50
J. F. Moyer,	Clarks Mills,	Mercer,	1	8	24	7	40
Penn'a State College,	State College,	Centre,	2	3	20	8	33
H. H. Pettengill & Son,	Corry,	Erie,		1	2	5	8
Elmer Procter,	Corry No. 3,	Erie,	1				1
F. W. Rifle,	Port Allegany,	McKean,	4	2	8	6	20
Percival Roberts, Jr.,	Narberth,	Montgomery,	2		18	9	29
Thompson Robinson,	Mercer No. 5,	Mercer,	1				1
W. H. Rockwell,	Ulster,	Bradford,	4	4	26	14	48

SHROPSHIRE SHEEP—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Penrose Rutter,	Holtwood No. 1,	Lancaster,			2		2
Samuel Sedam,	Muncy,	Lycoming,	1				1
S. Shaffer,	New Castle,	Lawrence,	4	4	30	12	50
Henry Singer,	Gap,	Lancaster,	1				1
Carl Smith,	Rossiter,	Indiana,	1				1
Wm. A. Smith,	Hollidaysburg,	Blair,	2				2
Chester Snyder,	Easton,	Northampton,			4		4
G. E. Tewkbury,	Brooklyn,	Susquehanna,	1		5		6
Edwin E. Tiffany,	Brooklyn,	Susquehanna,	4	1	20	2	27
H. V. Townsend,	Franklin Forks,	Susquehanna,			4	1	5
Jos. B. Twining,	Gettysburg,	Adams,	1	2	10	3	16
R. C. Vance,	Burgettstown No. 4,	Washington,	1	1	10	3	15
H. J. VanDyke,	Gettysburg No. 6,	Adams,		1	9	4	14
J. C. Walkinshaw,	Millwood,	Westmoreland,	1				1
John E. Watkins,	Westfield,	Tioga,	3	1	10	4	18
Albert Weaver,	Khedive,	Greene,			3		3
H. M. Welton,	Sandy Lake,	Mercer,		1	3		4
George D. Widener,	Elkins Park,	Montgomery,	1		13	18	32
E. W. Wilcox,	Crosby,	McKean,	1		10		11
W. W. Wilson,	Saxonburg,	Butler,			5		5
Jas. Wissinger & Son,	Home,	Indiana,			5		5
Totals,			105	82	820	185	1192

SOUTHDOWN SHEEP.

(Registry Association).

AMERICAN SOUTHDOWN BREEDERS' ASSOCIATION.

F. S. Springer, *Secretary*, Springfield, Ill.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Jos. Barron,	Slippery Rock No. 57,	Butler,	1		4	1	6
Eber Card,	Roulette,	Potter,	1	1			2
S. J. Davis,	Springs,	Somerset,	1		6		7
J. C. Enssley,	Avonia,	Erie,	1		15		16
Jas. K. Harper,	Imperial No. 1,	Allegheny,	1		3		4
S. N. Hill,	Markham,	Delaware,	1	6	14	5	26

SOUTHDOWN SHEEP—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
F. W. & W. A. McCoy,	Mercer,	Mercer,	3	3	30	10	46
H. M. Neal,	New Wilmington No. 1.	Lawrence,	1	-----	9	-----	10
Arthur E. Newbold, Jr.,	Laverock, Chest. Hill,	Montgomery,	1	-----	12	3	16
R. C. Vance,	Burgettstown No. 4,	Washington,	3	3	18	6	30
C. A. Wright,	Canton No. 71,	Bradford,	1	-----	10	-----	11
Totals,			15	13	121	25	174

SUFFOLK SHEEP.

(Registry Association).

AMERICAN SUFFOLK SHEEP ASSOCIATION.

Ottawa, Canada.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. C. Dickson,	Cochranton,	Crawford,	2	1	6	2	11

TUNIS SHEEP.

(Registry Association).

AMERICAN TUNIS SHEEP BREEDERS' ASSOCIATION.

Raymond H. Hays, *Secretary*, Bainbridge, Ind.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Pusey Coates,	Cochranville No. 2,	Chester,	1	-----	13	-----	14
J. C. Dickson,	Cochranton,	Crawford,	2	-----	4	-----	6
Samuel N. Hill,	Markham,	Delaware,	1	1	7	2	11
Totals,			4	1	24	2	31

ANGORA GOATS.

(Registry Association).

AMERICAN ANGORA GOAT BREEDERS' ASSOCIATION.

John W. Fulton, *Secretary*, Kansas City, Mo.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. C. Dickson,	Cochranton,	Crawford,	4	2	4	3	13

MILCH GOATS.

(Registry Association).

AMERICAN MILCH GOAT RECORD ASSOCIATION.

J. C. Darst, *Secretary*, Dayton, Ohio.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. W. Beecher,*	Pottsville,	Schuylkill,	1				1
G. R. Garrison,	Edgworth,	Allegheny,	1		1		2
Elizabeth A. Marshall,	Carnegie,	Allegheny,	1		5	3	9
Wm. H. Miller,	Carlisle,	Cumberland,	1		6		7
Mrs. E. S. Sharples,	Newtown,	Bucks,	1	1	9	3	14
L. M. Watkins,	Harrisburg,	Dauphin,	2		7		9
Totals,			7	1	28	6	42

*This party has a flock of 259 milch goats that are not registered.

BERKSHIRE SWINE.

(Registry Association).

AMERICAN BERKSHIRE ASSOCIATION.

F. S. Springer, *Secretary*, Springfield, Ill.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	**Total.**
E. D. Allen,	Harford,	Susquehanna,	1		1		2
Mac. B. Andrews,	Cochranton,	Crawford,		1	1	1	3
Ellis Artley,	Catawissa,	Columbia,	1				1
Leon L. Barndt & Co.,	Hellertown No. 3,	Northampton,				1	1
Robert Beattie,	Paoli, Box 14,	Chester,	1		1		2
Bonnyview Hall Farm,	Smithton,	Westmoreland,	1		2		3
John W. Burket,	Tyrone,	Blair,	1	1		1	3

BERKSHIRE SWINE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Elmer M. Byers,	Finleyville,	Washington,	1	-----	1	2	4
Carnegie Land Co.,	North Springfield,	Erie,	1	-----	1	-----	2
Eros H. Carpenter,	Eldred,	McKean,	1	-----	-----	-----	1
H. H. Cassler,	Holsopple,	Somerset,	2	3	5	3	13
Harvey Childs, Jr.,	Coraopolis No. 3,	Allegheny,	2	-----	2	-----	4
F. G. Crownover,	Saulsburg,	Huntingdon,	1	-----	3	-----	4
J. H. Dain,	Greenville,	Mercer,	2	17	14	15	48
J. H. Darr,	Ligonier,	Westmoreland,	-----	1	1	-----	2
Geo. E. Deming,	Corry No. 1,	Erie,	1	-----	6	-----	7
M. G. Dewey,	Meadville No. 10,	Crawford,	1	-----	2	-----	3
Ord J. Dohl,	Harveyville,	Luzerne,	1	-----	1	-----	2
P. F. Duncan,	Duncannon,	Perry,	-----	1	-----	1	2
C. A. Eagley,	North Girard,	Erie,	1	-----	2	-----	3
John H. Ehrhart,	Glenville,	York,	1	5	7	4	17
Ellsworth Collieries Co.,	Ellsworth,	Washington,	1	-----	2	-----	3
E. D. Ellsworth,	Meshoppen,	Wyoming,	1	-----	1	-----	2
W. A. Ely,	Kingsley,	Susquehanna,	-----	-----	1	-----	1
E. A. Engle,	Mt. Joy No. 4,	Lancaster,	-----	1	2	-----	3
Wm. S. Erdman,	Buckingham,	Bucks,	1	-----	2	4	7
M. L. Everitt,	Millerton No. 1,	Tioga,	1	-----	1	1	3
T. L. Eyre,	West Chester,	Chester,	1	-----	2	-----	3
A. J. Fell,	West Point,	Montgomery,	-----	1	-----	2	3
B. F. Fields,	Lima,	Delaware,	1	-----	4	-----	5
Jos. D. Findley,	Altoona,	Blair,	1	-----	3	-----	4
C. H. Firth,	Sugar Grove,	Warren,	1	-----	-----	-----	1
C. C. Fleming,	Clarion,	Clarion,	-----	-----	3	-----	3
J. Oscar Fretz,	Perkasie,	Bucks,	-----	-----	2	-----	2
Wm. F. Fretz,	Pipersville,	Bucks,	1	8	7	19	35
J. W. Galbreath,	Norristown No. 2,	Montgomery,	1	3	2	3	9
Davis Garret, Supt.,	Embreeville,	Chester,	5	6	8	9	28
F. B. Gartland,	Martinsburg,	Blair,	1	-----	1	-----	2
Robert George,	Indiana No. 5,	Indiana,	3	-----	8	1	12
W. W. Giffen,	Williamsport No. 1,	Lycoming,	1	-----	2	-----	3
W. L. Glatfelter,	Spring Forge,	York,	2	-----	6	1	9
J. N. Glover,	Vicksburg,	Union,	1	-----	2	-----	3
H. M. Gooderham,	Patton,	Cambria,	1	1	2	3	7
L. Albert Gray,	Lansdale No. 2,	Montgomery,	-----	1	2	-----	3
Fred Hall,	Baxter,	Jefferson,	1	-----	1	-----	2
P. F. Hamilton,	Cochranville,	Chester,	2	-----	7	-----	9
Hanover Stock Farm,	Hunlock Creek No. 2,	Luzerne,	3	14	18	24	59
Willard Harding,	South Eaton,	Wyoming,	1	-----	1	-----	2
Vallie Hawkins,	Fawn Grove,	York,	2	-----	11	-----	13
Claude K. Hawthorn,	Brookville,	Jefferson,	1	-----	1	-----	2
J. I. Hereter,	Gettysburg,	Adams,	1	1	3	-----	5
C. F. Hess,	Lititz,	Lancaster,	1	2	4	5	12
Enos M. Hostetter,	New Providence,	Lancaster,	1	-----	1	-----	2
L. S. Hummel,	Ebensburg,	Cambria,	1	-----	5	-----	6
H. W. Hunter,	Burgettstown,	Washington,	1	-----	-----	-----	1
W. L. Inghram,	Waynesburg,	Greene,	1	-----	2	-----	3
Chas. A. Johnson,	New Galilee No. 1,	Lawrence,	1	5	1	5	12
Chas. Jones,	Centerville,	Crawford,	-----	1	-----	1	2
Edward Jones,	Wilmore No. 1,	Cambria,	1	-----	2	-----	3
C. C. Keiser,	Marietta,	Lancaster,	-----	1	1	-----	2
L. J. & J. H. Kenamond,	Canonsburg,	Washington,	2	-----	4	-----	6
Irvine P. Knipe,	Norristown,	Montgomery,	1	-----	2	-----	3
H. P. Kuhn,	Gibsonia,	Allegheny,	1	-----	-----	4	5
Jos. Lambour,	Nicktown,	Cambria,	2	-----	5	-----	7
Elbert W. Lapp,	Berwyn No. 1,	Chester,	2	3	10	6	21
Moses Lapp,	Gap,	Lancaster,	1	-----	1	-----	2
B. Homer Le Boutillier,	Paoli,	Chester,	2	-----	1	-----	3
John Lloyd,	Hollidaysburg,	Blair,	1	-----	3	-----	4
F. A. Lockwood,	Berwyn,	Chester,	2	-----	4	-----	6
R. S. Love,	Mt. Pleasant,	Westmoreland,	1	-----	4	-----	5
A. B. McCormick & Son,	Stoneboro,	Mercer,	-----	2	3	1	6
S. V. McDowell & Sons,	Fredonia,	Mercer,	1	3	-----	8	12
A. S. McQuilkin,	Dayton,	Armstrong,	1	-----	1	-----	2

BERKSHIRE SWINE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
L. O. Marshall,	Dayton,	Armstrong,	-----	-----	-----	1	1
M. B. C. Orphanage and Home.	Centre Valley,	Lehigh,	1	1	8	-----	10
J. F. Menoher,	Ligonier,	Westmoreland,	1	-----	1	-----	2
Isaac N. Messinger,	Watsontown No. 2,	Northumberland,	1	-----	2	-----	3
A. A. Miller,	Mercer,	Mercer,	2	1	5	9	17
Milton O. Moore,	Washington No. 7,	Washington,	1	-----	2	-----	3
J. Cheston Morris,	West Chester,	Chester,	3	-----	2	4	9
J. S. Nawgel,	Bedford,	Bedford,	1	-----	1	-----	2
Geo. Nelson,	Wilcox No. 1,	Elk,	1	-----	1	-----	2
Penn'a Epileptic Hospital and Colony Farm.	Oakbourne,	Chester,	1	-----	3	-----	4
Penn'a State College,	State College,	Centre,	1	-----	2	-----	3
Pine Run Farm,	Penllyn,	Montgomery,	1	2	3	-----	6
Nelson Poorbaugh,	Mt. Pleasant,	Westmoreland,	1	-----	4	3	8
Lewis E. Reabuck,	Coopersburg,	Lehigh,	1	-----	1	-----	2
I. A. Rockwell,	Troy No. 66,	Bradford,	-----	1	1	2	4
Lawrence Rodgers,	Volant,	Lawrence,	-----	-----	1	-----	1
J. A. Rose,	Lehighton,	Carbon,	2	3	2	1	8
J. Townsend Russell,	Silver Lake,	Susquehanna,	1	-----	3	4	8
Edw. H. Scholl,	Allentown No. 2,	Lehigh,	1	-----	6	-----	7
J. F. Schramm,	Fombell,	Beaver,	1	-----	1	-----	2
Sell & Lohr,	Youngwood,	Westmoreland,	1	-----	3	-----	4
H. D. Sheppard,	Hanover,	York,	1	-----	8	-----	9
L. L. Shreve,	Spartansburg,	Crawford,	-----	-----	-----	2	2
J. H. Silvis,	Greensburg No. 3,	Westmoreland,	1	-----	1	6	8
David K. Sloan,	Pottstown,	Chester,	-----	-----	-----	2	2
G. Smith & Sons,	Seelyville,	Wayne,	1	-----	3	-----	4
S. J. Stahlman,	Brookville No. 6,	Jefferson,	-----	1	-----	1	2
J. W. Stephens,	Newport No. 3,	Perry,	1	-----	1	-----	2
W. S. Stevenson,	Hookstown,	Beaver,	1	-----	3	-----	4
Vern T. Struble,	Athens,	Bradford,	1	-----	2	-----	3
F. B. Tait,	Mercer No. 2,	Mercer,	-----	-----	-----	1	1
R. H. Tompkins,	Lansdale,	Montgomery,	1	1	1	4	7
F. M. Twining,	Wycombe,	Bucks,	1	1	4	3	9
C. P. Tuttle,	Smith's Ferry,	Beaver,	1	-----	3	-----	4
Arthur H. White,	Pulaski,	Lawrence,	-----	2	2	3	7
S. J. Wiley,	Fawn Grove,	York,	1	-----	5	-----	6
Samuel Yost,	Stillwater,	Columbia,	1	8	3	8	20
Totals,			112	103	297	179	691

CHESHIRE SWINE.

(Registry Association).

CHESHIRE SWINE BREEDERS' ASSOCIATION.

E. S. Hill, *Secretary*, Freeville, N. Y.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Fred W. Card,	Sylvania,	Bradford,	1		5		6
Charles W. Creasy,	Catawissa,	Columbia,	1		2		3
G. G. Davis,	Glen Hope,	Clearfield,			1		1
B. F. Gabler & Son,	Greensboro No. 1,	Greene,	1	1	2	3	7
Knecht Milling Co.,	Parvin,	Clinton,			2		2
H. Wayne Pierce,	Towanda No. 2,	Bradford,	1		1	7	9
H. C. Reynolds,	Scranton,	Lackawanna,			1	1	2
J. H. Shutz,	Shickshinny,	Columbia,	1				1
Totals,			5	1	14	11	31

CHESTER WHITE SWINE.

(Registry Association).

NATIONAL CHESTER WHITE RECORD ASSOCIATION.

Thomas Sharpless, *Secretary*, West Chester, Pa.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
U. S. Achenbach & Son,	Bath,	Northampton,	1			2	3
J. Lewis Baldwin,	E. Downingtown,	Chester,			2		2
W. L. Barnhart,	Llewellyn,	Schuylkill,	1		1		2
W. E. Bates,	Stevensville,	Bradford,			2		2
F. W. Bechtel,	Neffs,	Lehigh,	1				1
John W. Birkey,	Newportville,	Bucks,	1	5	2	2	10

CHESTER WHITE SWINE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Frederick C. Brinton, Jr.	West Chester,	Chester,	1	-----	10	-----	11
S. S. Calhoun,	Smicksburg,	Indiana,	1	-----	2	-----	3
A. J. Cullen,	Elkview,	Chester,	1	-----	4	-----	5
C. H. Dildine,	Orangeville,	Columbia,	2	-----	4	-----	6
Fred Z. Deschamps,	Forest Grove,	Bucks,	1	-----	2	3	6
R. A. Dunwiddie,	Heilwood R. D.,	Indiana,	1	-----	1	-----	2
F. H. Fitch,	Granville Summit,	Bradford,	-----	1	1	-----	2
Jos. T. Fleming,	Belleville,	Mifflin,	1	-----	5	-----	6
Jas. G. Fox,	Hummelstown,	Dauphin,	1	-----	1	-----	2
Davis Garrett, Supt.,	Embreeville,	Chester,	4	6	15	18	43
Geo. W. Kunkle,	Lewisburg,	Union,	1	-----	1	-----	2
F. W. Levis,	Chadds Ford No. 1,	Delaware,	2	20	8	30	60
T. W. & W. A. McCoy & Sons.	Mercer,	Mercer,	-----	-----	4	6	10
W. S. McHenry,	Rohrsburg,	Columbia,	1	-----	4	-----	5
J. K. McLaughlin,	Spruce Hill,	Juniata,	1	-----	1	-----	2
G. W. Messinger,	Mechanicsburg No. 5,	Cumberland,	1	-----	2	-----	3
John A. Miller,	Pine Grove,	Schuylkill,	1	-----	2	-----	3
Murray A. Miller,	Milton No. 3,	Northumberland,	1	-----	3	-----	4
J. B. Ogden,	Clearfield,	Clearfield,	1	-----	1	-----	2
R. Brognad Okie,	Devon,	Chester,	1	6	3	9	19
Penn'a State College,	State College,	Centre,	-----	-----	1	1	2
A. Brinton Reynolds,	Avondale,	Chester,	1	-----	1	-----	2
Rick & Herr,	Reading,	Berks,	1	-----	2	-----	3
Thos. Simpers,	Kennett Square,	Chester,	1	-----	2	-----	3
Chas. M. Thomas,	West Chester No. 3,	Chester,	-----	-----	2	-----	2
Knute Thurkeldson,	Chadds Ford,	Delaware,	1	-----	2	-----	3
Edward Walter,	West Chester,	Chester,	4	13	8	23	48
Willow Brook Farm,	Catasauqua,	Lehigh,	1	-----	5	-----	6
J. H. Wingert,	Lewisburg,	Union,	1	-----	1	-----	2
David B. Zook,	New Holland,	Lancaster,	2	3	4	8	17
Totals,			39	54	109	102	304

DUROC-JERSEY SWINE.

(Registry Associations).

THE NATIONAL DUROC-JERSEY RECORD ASSOCIATION.

J. R. Pfander, *Secretary*, Peoria, Ill.

THE AMERICAN DUROC-JERSEY SWINE BREEDERS' ASSOCIATION.

T. B. Pearson, *Secretary*, Thornton, Ind.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
E. M. Archey,	Mill Hall, R. D.,	Clinton,	-----	-----	-----	1	1
N. M. Beach,	Mansfield,	Tioga,	1	-----	1	-----	2
A. C. Bricker,	Mercersburg,	Franklin,	1	-----	1	-----	2
M. J. Brumbaugh,	Greencastle,	Franklin,	1	1	2	2	6
John Cassidy & Sons,	Hanlin Station,	Washington,	1	3	2	1	7
C. B. Colegrove,	Corry,	Eric,	1	-----	1	-----	2
F. W. Gass,	Sunbury No. 3,	Northumberland,	1	-----	1	-----	2
C. A. Griscom,	Gladwyne,	Montgomery,	1	-----	7	16	24
Samuel H. Harmon,	Bloomsburg,	Columbia,	1	1	14	17	33
C. O. Hauseknesht,	Overton,	Bradford,	-----	1	1	1	3
T. E. Hyde,	Bloomsburg,	Columbia,	1	1	3	7	12
M. J. MacKay,	Emporium,	Cameron,	1	1	1	3	6
G. W. McFarlin,	Grove City,	Mercer,	1	-----	1	-----	2
J. M. Marshall,	Atwood,	Armstrong,	-----	1	-----	-----	1
Geo. H. Musser,	Curtin,	Centre,	-----	-----	-----	2	2
Geo. S. Peffer,	Newville,	Cumberland,	1	-----	1	-----	2
Penn'a State College,	State College,	Centre,	-----	-----	2	-----	2
A. C. Peterson,	Knox,	Clarion,	1	1	-----	3	5
Pittsburg Buffalo Co.,	Pittsburgh,	Allegheny,	1	2	10	7	20
Post Bros.,	West Alexander,	Washington,	-----	3	1	1	5
C. S. Powell,	Ardmore,	Montgomery,	1	-----	2	-----	3
G. W. Ralston,	Center Hall,	Centre,	-----	1	-----	-----	1
J. W. Reimer,	Arnold No. 1,	Westmoreland,	1	-----	-----	-----	1
Mrs. W. B. Saunders,	Bryn Mawr,	Montgomery,	-----	1	-----	4	5
Harvey E. Smith,	Chawville,	Clearfield,	1	-----	-----	-----	1
D. A. Sprogg,	West Alexander,	Washington,	1	-----	1	-----	2
S. P. Sutor,	Scottdale,	Westmoreland,	1	-----	4	-----	5
F. A. Taylor,	Laporte,	Sullivan,	-----	1	-----	2	3
Jos. B. Twining,	Gettysburg,	Adams,	1	5	5	1	12
A. M. Wood & Co.,	Gibsonia No. 1,	Allegheny,	3	20	10	42	75
Totals,			23	43	71	110	247

HAMPSHIRE SWINE.

(Registry Association).

AMERICAN HAMPSHIRE SWINE RECORD ASSOCIATION.

E. C. Stone, *Secretary*, Armstrong, Ill.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Wm. M. Bigham's Sons,	Gettysburg,	Adams,	1	-----	3	-----	4
J. H. & G. A. Magee,	Portersville No. 83,	Butler.	1	-----	2	-----	3
Walter H. Singer,	Gap,	Lancaster,	1	-----	-----	2	3
O. H. Swogger & Son,	Mercer,	Mercer,	1	3	1	2	7
Totals,			4	3	6	4	17

MULE FOOT HOGS.

(Registry Association).

NATIONAL MULE FOOT HOG RECORD ASSOCIATION.

W. H. Morris, *Secretary*, Indianapolis, Ind.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. C. Dickson,	Cochranton,	Crawford,	1	-----	1	-----	2
Wm. F. Smith,	Greenville No. 45,	Mercer,	-----	1	1	3	5
John Zimers,	Jacobs Creek,	Westmoreland,	-----	1	-----	1	2
Totals,			1	2	2	4	9

O. I. C. SWINE.

(Registry Association).

THE O. I. C. SWINE BREEDERS' ASSOCIATION.

O. C. Vernon, *Secretary*, Millersburg, Ind.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Asher G. Glenn,	Garman's Mills No. 1,	Indiana,	2	3	6	4	15
Harry S. Johnson,	Quakertown,	Bucks,	-----	1	-----	3	4
D. W. Jones,	Wilmore,	Cambria,	1	3	2	8	14
R. S. Love,	Mt. Pleasant No. 1,	Westmoreland,	1	-----	-----	-----	1
J. C. Middleton,	Bedford No. 3,	Bedford,	1	-----	2	-----	3
J. H. Morrow,	Karns City No. 74,	Butler,	2	-----	5	-----	7
H. L. Slick,	Roaring Spring,	Blair,	1	-----	-----	-----	1
R. A. Taylor,	Allen,	Cumberland,	1	10	11	14	36
D. M. Young,	Milan,	Bradford,	-----	-----	-----	2	2
Totals,			9	17	26	31	83

POLAND-CHINA SWINE.

(Registry Associations).

THE STANDARD POLAND-CHINA RECORD ASSOCIATION.

G. F. Woodworth, *Secretary*, Maryville, Mo.

NATIONAL POLAND-CHINA RECORD CO.

A. M. Brown, *Secretary*, Winchester, Ind.

THE AMERICAN POLAND-CHINA RECORD ASSOCIATION.

W. M. McFadden, *Secretary*, Chicago, Ill.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
S. L. Bertolet,	Spring City,	Chester,	1	-----	2	-----	3
J. E. Bird,	Dushore,	Sullivan,	1	1	1	1	4
E. Kirk Brown,	Nottingham,	Chester,	1	1	1	4	7
Burns & Adams,	Imperial No. 1,	Allegheny,	1	-----	1	2	4
D. O. Collins,	Laceyville No. 4,	Wyoming,	1	-----	-----	-----	1
Ross Crawford,	Tyrone No. 1,	Blair,	1	-----	1	-----	2

POLAND CHINA SWINE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. E. Cummingham,	West Alexander No. 2,	Washington,	3	-----	6	-----	9
Geo. W. Deeds,	Ligonier,	Westmoreland,	1	3	7	12	23
P. M. Detrick,	Sugar Run,	Bradford,	-----	-----	1	-----	1
J. C. Dickson,	Cochranton,	Crawford,	1	-----	1	2	4
C. H. Dilcline,	Orangeville,	Columbia,	1	-----	5	-----	6
P. F. Hamilton,	Cochranville,	Chester,	2	-----	16	-----	18
C. A. Hershey,	Tillie,	Adams,	1	-----	3	-----	4
A. M. Hodgson,	New London,	Chester,	1	-----	4	-----	5
John L. Huffman,	New Albany No. 44,	Bradford,	1	-----	1	-----	2
A. J. Laushey,	Bird-in-Hand,	Lancaster,	1	-----	-----	-----	1
E. M. Lowe,	Sugar Grove,	Warren,	1	5	1	6	13
J. L. Luse,	Clarksville,	Greene,	1	-----	4	-----	5
J. W. McIntire,	Dayton No. 3,	Armstrong,	1	1	4	1	7
T. B. Narigon,	West Alexander No. 1,	Washington,	-----	-----	1	-----	1
J. D. Nicholas,	Watsontown,	Northumberland,	1	3	1	2	7
Henry Nornhold,	Globe Mills,	Snyder,	2	5	2	2	11
Kore E. Peachey,	Kishacoquillas,	Mifflin,	-----	-----	3	-----	3
Penn'a State College,	State College,	Centre,	-----	-----	2	-----	2
H. J. Phillippi,	Ligonier No. 3,	Westmoreland,	1	-----	2	-----	3
Elmer Proctor,	Corry,	Erie,	1	1	1	3	6
John S. Reister,	Nottingham No. 3,	Chester,	1	-----	2	-----	3
A. G. Shaffer,	Shelocta No. 1,	Armstrong,	-----	-----	1	-----	1
E. E. Shively,	Watsontown,	Northumberland,	-----	1	1	2	4
Jos. C. Sibley,	Franklin,	Venango,	3	1	5	3	12
N. D. Snyder,	Laceyville,	Wyoming,	1	-----	4	-----	5
Sprowls & Slemmons,	Claysville No. 6,	Washington,	1	-----	1	-----	2
F. C. Stahlman,	Charleroi,	Washington,	1	1	6	-----	8
J. W. Stewart,	Jefferson,	Greene,	1	-----	1	-----	2
J. B. W. Stufft,	Ralphton,	Somerset,	1	-----	-----	-----	1
United Brethren Orphanage.	Quincy,	Franklin,	1	-----	2	-----	3
Wm. F. Wagner,	Harrison City,	Westmoreland,	1	-----	3	-----	4
Totals,			37	23	97	40	197

TAMWORTH SWINE.

(Registry Association).

THE AMERICAN TAMWORTH SWINE RECORD ASSOCIATION.

E. N. Ball, *Secretary*, Hamburg, Mich.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
J. C. Dickson,	Cochranton,	Crawford,	1	4	1	5	11
R. S. Hartley,	Pittsfield,	Warren,	2	5	4	5	16
Penn'a State College,	State College,	Centre,	-----	-----	2	-----	2
O. H. Swogger & Son,	Mercer,	Mercer,	1	1	-----	1	3
Totals,			4	10	7	11	32

YORKSHIRE SWINE.

(Registry Association).

THE AMERICAN YORKSHIRE CLUB.

Harry G. Krum, *Secretary*, White Bear Lake, Minn.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
Jos. Barron,	Slippery Rock No. 57,	Butler,	1	2	-----	6	9
Geo. L. Bonnell,	Waterford, R. D.,	Erie,	-----	-----	-----	1	1
Arthur Brown,	Kylertown,	Clearfield,	-----	-----	1	2	3
Geo. L. Clauson,	Galilee,	Wayne,	1	-----	-----	-----	1
P. Compton,	Elk Lick,	Somerset,	1	-----	-----	-----	1
Henry C. Gass,	Bellevue No. 4,	Allegheny,	-----	1	-----	1	2
Harry L. Hoopy,	West Fairview,	Cumberland,	1	-----	2	-----	3
H. Kingsley,	Emlenton No. 65,	Venango,	1	-----	-----	-----	1
Clark McKee,	Rossiter,	Indiana,	1	-----	1	-----	2
Fred W. Malin,	Fentonville, N. Y., R. D.	Warren (Pa.),	-----	1	-----	1	2

YORKSHIRE SWINE—Continued.

NAME.	ADDRESS.	COUNTY.	Males over 1 year old.	Males under 1 year old.	Females over 1 year old.	Females under 1 year old.	Total.
F. P. Meneer,	Ruffs Dale,	Westmoreland,		1			1
Geo. F. Miller,	New Kingston,	Cumberland,	1		1		2
W. E. Moneyer,	Tidioute,	Warren,			1		1
Arthur E. Newbold,	Chestnut Hill,	Montgomery,	1		2	7	10
J. S. Nicholas & Son,	Watsontown,	Northumberland,	1	5	1	5	12
Penn'a State College,	State College,	Centre,			1		1
Jos. Peters,	Woodland,	Clearfield,	1				1
B. F. Watson,	Mt. Joy,	Lancaster,	1		1		2
Darius M. Young,	Milan,	Bradford,	1	1		3	5
Totals,			12	11	11	26	60

RECAPITULATION.

HORSES.

	Number.
Arabian,	3
Belgian Draft,	106
Cleveland Bay,	1
Clydesdale,	19
French Coach,	2
French Draft,	16
German Coach,	2
Hackney,	140
Morgan,	29
Percheron,	480
Saddle Horses,	4
Shire,	69
Suffolk,	3
Thoroughbred,	151
Trotting,	100
Asses,	2
Shetland Ponies,	158
Total,	1,285

CATTLE.

Aberdeen-Angus,	257
Ayrshire,	938
Brown Swiss,	194
Devon,	103
Dutch Belted,	14
Guernsey,	2,525
Hereford,	61
Holstein Friesian,	6,269
Jersey,	2,856
Polled Durham,	76
Red Polled,	183
Short Horn,	1,463
Total,	14,939

SHEEP.

Black-Faced Highland,	6
Cheviot,	49
Cotswold,	48
Dorset,	346
Hampshire-Down,	340
Leicester,	21
Lincoln,	16
Merino,	1,944
Oxford Down,	54
Shropshire,	1,192
Southdown,	174
Suffolk,	11
Tunis,	31
Angora Goats,	13
Milch Goats,	42
Total,	4,287

SWINE.

Berkshire,	691
Cheshire,	31
Chester White,	304
Duroc-Jersey,	247
Hampshire,	17
Mule Foot,	9
O. I. C.,	83
Poland-China,	197
Tamworth,	32
Yorkshire,	60
Total,	1,671

PURE BRED STALLIONS LICENSED IN PENNSYLVANIA DURING THE YEAR 1910-1911.

Adams County

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
498	Adams County Percheron Horse Co.,	Gettysburg,	Romulus,	Percheron.
387	F. C. Avery,	Gettysburg,	Asa Danforth,	Standardbred.
815	Buttonwood Stock Farm,	Gettysburg,	Senator Hale,	Standardbred.
816	Buttonwood Stock Farm,	Gettysburg,	St. Julius,	Standardbred.
588	Gettysburg German Coach Horse Co.,	Gettysburg,	Sieto,	German Coach.
302	John E. Hughes,	Gettysburg,	Standard Prince,	Standardbred.
184	W. H. Johnston,	Fairfield,	Gilpin,	Percheron.
419	J. E. Kissinger,	Gettysburg,	Steve,	French Draft.
670	E. S. Shriver,	Gettysburg,	Nicolet,	Percheron.

Allegheny County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
390	H. C. Boyd,	Coraopolis,	Grand Central,	Standardbred.
846	C. B. Burns,	Imperial,	Vainquer,	Percheron.
847	C. B. Burns,	Imperial,	Gonzaque,	Percheron.
53	John B. Cole,	Wexford,	Telemague,	Belgian.
626	W. D. Crooks,	Imperial,	Philis,	Percheron.
228	H. W. Delong,	Imperial,	Sunny McKinney,	Standardbred.
229	H. W. Delong,	Imperial,	Pleasant McKinney,	Standardbred.
740	R. H. Gilliford,	Pittsburgh,	Davis Hal,	Standardbred.
741	R. H. Gilliford,	Pittsburgh,	Gilhal,	Standardbred.
48	L. A. Gorby,	Pittsburgh,	Inheritance,	Standardbred.
874	C. G. Gould,	Imperial,	John H. Gould,	Standardbred.
242	Wm. A. Hadfield,	Allegheny,	Allseer,	Standardbred.
403	W. D. Henry,	Sewickley,	Nipper, Jr.,	Hackney.
404	W. D. Henry,	Sewickley,	Irvington Why Not,	Hackney.
469	Geo. A. Hogg,	Pittsburgh,	Gerald,	Shire.
261	Geo. A. Hogg,	Pittsburgh,	Nateby Wynn,	Shire.
576	R. M. Huston & Sons,	Option,	Borelli,	Belgian.

577	R. M. Huston & Sons,	Option,	Francolin,	Belgian.
270	Wm. B. Kennihan,	Bakerstown,	Garnet Cross,	Clydesdale.
27	J. H. Moore,	Pittsburgh,	Hal at Law,	Standardbred.
28	J. H. Moore,	Pittsburgh,	Crown Jay,	Standardbred.
98	Louis Ritter,	Unity Station,	Montezuma,	Percheron.
277	C. N. VanSickle,	Oakdale,	Empressenment,	Standardbred
278	C. N. VanSickle,	Oakdale,	Hallebardier,	Percheron.
279	C. N. VanSickle,	Oakdale,	Prince,	Percheron.

Armstrong County.

414	S. E. Ambrose,	Rural Valley,	Catalina,	Percheron.
321	Armstrong County Horse Co.,	Kittanning,	Olliver,	Percheron.
444	David Baker and C. R. Riddle,	Freeport, R. D. No. 1,	Turenne,	Percheron.
211	Nelson Bowser,	Ford City,	Time Bee Bee,	Standardbred.
320	J. A. Davis,	Widnoon,	Rustique,	Percheron.
431	Dayton Percheron Horse Co.,	Dayton,	Berlin,	Percheron.
496	D. F. Elwood,	Apollo,	Ashland A,	Standardbred.
343	D. B. Gourley,	Leechburg,	Cousin,	German Coach.
344	D. B. Gourley,	Leechburg.	Udier,	Percheron.
423	E. Hoover,	Kittanning,	Minolier,	Percheron.
323	G. H. Keener,	Freeport, R. D. No. 2,	Silver Heels,	Percheron.
471	Kittanning and Ford City French Coach Horse Company.	Ford City,	Escladeur,	French Coach.
647	O. C. Lewis,	Dayton,	Glendower,	Shire.
637	J. W. Patterson,	Apollo,	Horace,	Percheron.
121	Albert T. Riggle,	Cochran Mills,	Governor Leon,	French Draft.
071	J. C. Shaffer,	Dayton,	Prince,	French Draft.
186	J. C. Shaffer,	Dayton,	Delbert,	Percheron.
820	Grant Shuster,	Freeport,	Dandin,	French Coach.
636	A. G. C. Walker,	Kelley Station,	Goldwave,	Hackney.
797	O. N. Wilson,	Kittanning,	Jeff,	Percheron.
322	O. N. Wilson and G. H. Keener,	Kittanning,	Mendigot,	Percheron.

Beaver County.

764	Allison & Blackmore,	Hookstown,	Egremont,	Standardbred.
624	S. L. Bailey,	Darlington, R. D. No. 2,	Pride of the Valley,	Percheron.
424	Bonzo Bros.,	Ellwood City, R. D. No. 1,	Concurrent,	Percheron.
425	Bonzo Bros.,	Ellwood City, R. D. No. 1,	Coco de Berloz,	Belgian.

Beaver County—Continued.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
426	Bonzo Bros.,	Ellwood City, R. D. No. 1,	Major de Lette,	Belgian.
427	Bonzo Bros.,	Ellwood City, R. D. No. 1,	Morgan,	Belgian.
864	Fox & Sutton,	Beaver Falls,	Willow Burns,	Standardbred.
865	Fox & Sutton,	Beaver Falls,	Henry Williams,	Standardbred.
834	Geo. H. McBride,	Beaver Falls,	Servitor,	Standardbred.
733	C. C. McCoy,	New Sheffield,	Creedmond,	Standardbred.
45	Harry M. Owens,	New Galilee,	Shadeland Eclipse,	Percheron.
306	Wm. R. Rambo,	New Sheffield,	Prince Henry,	Percheron.
408	John C. Reed,	Hookstown,	Masse D'or,	Belgian.

Bedford County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
894	S. W. Bittner,	New Bucna Vista,	Tyrol,	Belgian.
363	Jas. F. Clabaugh,	Everett,	Banner Brilliant,	Percheron.
64	C. U. Clayeomb,	Osterburg,	Diamond,	Percheron.
109	G. W. Dibert,	Bedford,	Royal Sentinel,	Standardbred.
422	L. B. Ferry,	Woodbury,	Taupin, Jr.,	Percheron.
434	H. W. Fetter & Co.,	Salemville,	Colodmir,	Percheron.
857	John S. Guyer,	New Enterprise,	Conductor,	Percheron.
570	John H. Hoover,	Everett, R. D. No. 1,	Feldmann,	German Coach.
153	Elza McElfish,	Chaneyville,	Militaire,	Percheron.
312	D. A. Shaffer,	King,	Patrice,	Percheron.

Berks County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
241	F. H. Brintzchoff,	Dryville,	Tony,	Percheron.
830	Isaac Gulden Irey,	Douglassville,	Mystic,	French Coach.
831	Isaac Guiden Irey,	Douglassville,	Artist,	Percheron.
495	Brooke Ludwig,	Douglassville,	Penn Hokder,	Standardbred.

441	Brooke Ludwig,	Douglassville,	Nut Bel View,	Standardbred.
19	W. Harry Orr,	Reading,	Baronhurst,	Standardbred.
20	W. Harry Orr,	Reading,	Ashland Wilkes,	Standardbred.
39	W. Harry Orr,	Reading,	Baronmore,	Standardbred.
732	Rehrersburg Horse Co.,	Rehrersburg,	Vigilant,	German Coach.
664	Chas. S. Ritter,	Boyertown,	Cyclone,	Percheron.
132	R. D. Wenrich,	Wernersville,	Godio,	Standardbred.

Blair County.

698	David Berkhimer,	Duncanville,	Farfardet,	French Coach.
476	David Berkhimer,	Duncanville,	Mytre,	Percheron.
787	J. D. Bloomhardt,	Altoona,	Duke,	Percheron.
875	Ira E. Brumbaugh,	Martinsburg,	Hardi,	Percheron.
289	John W. Burket,	Tyrone, R. D.,	Wapta,	Percheron.
162	Mathew Calvin,	Hollidaysburg,	Red Boy,	Belgian.
266	O. G. Fleck,	Tyrone, R. D.,	Vaillant,	Percheron.
466	Merrill & Yon,	Altoona,	Charm Ward,	Standardbred.
467	Merrill & Yon,	Altoona,	Rewardman,	Standardbred.
504	Tyrone Breeders' Association,	Tyrone,	Hebron,	German Coach.
606	J. S. Vipond,	Altoona,	Colonel Dewey,	Standardbred.

Bradford County.

819	Willard Arnold,	Granville Summit,	Morgan Sensation,	Morgan.
243	Belgian Draft Horse Co.,	Columbia Cross Roads,	Marcel d'Essche,	Belgian.
245	Bradford County German Coach Horse Breeders' Association.	Troy, R. D. No. 66,	Elbert,	German Coach.
792	J. D. Cummings,	Monroeton,	Dudley Boy,	Standardbred.
933	Wm. Ellsworth,	Wyalusing,	Ontario,	Percheron.
231	Asa S. Ennis & Son,	Standing Stone,	Cedric,	Percheron.
920	F. V. Frisbie,	Wysox,	Billy Dare,	Morgan.
497	F. V. Frisbie,	Wysox,	Fortune,	Morgan.
269	J. B. Gorstine,	Wysox,	Guy Dillon,	Standardbred.
272	L. O. Harris,	Granville Summit,	French Monarch,	Percheron.
436	Harry Howland,	LeRaysville,	Ben,	German Coach.
625	C. H. Jennings,	Towanda,	Black Bob,	Percheron.
200	W. H. Layman,	New Albany,	Gladiateur,	Percheron.
463	Lyon Bros.,	Wyalusing,	Kasbath II,	French Coach.
342	L. G. Marshall,	Towanda,	Aerobate,	Percheron.

Bradford County—Continued.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
326	Overton and Eldredville Horse Co.,	Overton,	Negro,	Percheron.
736	Louis Piollett and F. E. VanNess,	Wysox,	Marque de Fleuris,	Belgian.
456	Lincoln Welles Estate,	Wyalusing,	Monarch,	Percheron.
529	Chas. N. Shaffer,	Overton,	Patriot,	French Coach.
905	G. G. Summer,	LeRaysville,	Catalpa Charley,	Percheron.
331	A. J. Wells,	LeRaysville,	Kid Custer,	Standardbred.
532	Wilawana Percheron Horse Co.,	Wilawana,	Luvois,	Percheron.
907	F. S. Worden,	Canton,	Charley Patch,	Standardbred.
330	Jos. J. Zurn,	Towanda,	Prince Welles,	Percheron.

Bucks County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
902	John R. Buckman,	Newtown,	Paul Clifford,	Standardbred.
38	T. Cadwallader,	Doylestown,	Claycalla,	Standardbred.
618	Anthony Masino,	Taylorsville,	King Althus,	Standardbred.
149	Allison Ricker,	Hilltown,	James Alford,	Standardbred.
8	Mrs. A. K. Smith,	Taylorsville,	Andrew Wood,	Standardbred.
487	J. J. Tierney,	Newtown,	Chalet,	Percheron.
752	P. W. Torbert,	Buckmanville,	Payson T.,	Standardbred.
753	P. R. Torbert,	Buckmanville,	Lord Beck,	Standardbred.
700	A. F. Weisel, Agt.,	Doylestown,	Iago,	French Coach.
701	A. F. Weisel, Agt.,	Doylestown,	Royal Drake,	Standardbred.
702	A. F. Weisel, Agt.,	Doylestown,	Edward Drake,	Standardbred.

Butler County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
943	John E. Atwell,	Harrisville,	Bay Jerry,	French Draft.
633	N. B. Boosel,	Sherwin,	Crimper,	Percheron.
551	J. B. Burk,	Eau Claire,	Cropier,	Percheron.
801	C. L. DeWolf,	Chicora,	Director Lee,	Non Standard.

333	W. S. Douthett,	Renfrew, R. D. No. 29,	Russell D,	Standardbred.
660	J. M. Graham,	Cabot, R. D. No. 15,	Paul,	French Draft.
307	David Hesselgesser,	Cabot, R. D. No. 17,	King Edward,	Clydesdale.
338	J. N. Ifft,	Evans City,	Domino,	Percheron.
595	J. H. Kidd,	Mars, R. D. No. 30,	Eugene,	Percheron.
514	J. H. Kidd,	Mars, R. D. No. 30,	Virginius,	Percheron.
172	J. H. Kidd,	Mars, R. D. No. 30,	Loyal,	Percheron.
58	Henry Kreiss,	Butler, R. D. No. 9,	Geronemo,	Standardbred.
566	Frank M. Kuhn,	Karns City, R. D. No. 74,	Gassot,	Percheron.
418	W. E. Lackey,	Chicora,	Captain Director,	Non Standard.
203	McCandless & Renick,	Claytonia,	Romeo,	Percheron.
204	McCandless & Renick,	Claytonia,	Burnaston Blaze,	Shire.
474	Alonzo McCandless,	Euclid, R. D. No. 45,	Vendetta Boy,	Standardbred.
475	Alonzo McCandless,	Euclid, R. D. No. 45,	Brilliant,	Percheron.
353	Z. S. McNess,	Euclid, R. D. No. 46,	Hal Dillard II,	Standardbred.
358	John Marburger,	Evans City,	Baccarat,	Percheron.
565	T. J. Milford,	Eau Claire,	Edo,	German Coach.
575	Peter Miller,	Harmony, R. D. No. 39,	Bismark,	Belgian.
696	S. G. Oliver,	Valencia,	Harry Oliver,	Standardbred.
502	P. F. Ray,	West Sunbury,	Truly,	Percheron.
240	P. F. Ray,	West Sunbury,	Djalma de Thien,	Belgian.
608	J. M. Steinbrook,	Chicora,	Frank Arlington,	Standardbred.
126	Snyder Bros.,	Euclid,	Piston de Meirin,	Belgian.
61	C. L. Stieghner,	Fenelton, R. D. No. 3,	Maple Grove,	Standardbred.
734	David West & Co.,	Prospect,	Tribaulet,	Percheron.

Cambria County.

448	Geo. M. Baker,	Carrolltown,	Express,	Percheron.
265	H. B. Baumgardner,	South Fork, R. D. No. 1,	Pekin,	Percheron.
359	E. P. Bender,	Carrolltown,	Chief of Olentagny,	French Draft.
705	Lewis Berkebile,	Johnstown,	Shadeland Forester,	Standardbred.
706	Lewis Berkebile,	Johnstown,	Shadeland Provo,	Percheron.
21	M. J. Bradley,	Cresson, R. D.,	Neron,	Belgian.
510	Edward Costlow,	Sidman,	Eagle Jay,	Standardbred.
287	F. I. Farabaugh,	Vintondale,	Woodlong,	Standardbred.
96	John F. Hice,	Wilmore,	Brilliant Duke,	Percheron.
147	E. P. Shoemaker,	Cassandra,	George Gentry,	Standardbred.
115	Hiram Yoder,	Wilmore,	Besique III,	Percheron.

Cameron County.

(Nothing Registered.)

Carbon County.

(Nothing Registered.)

Centre County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
557	L. E. Bolopue,	Blanchard,	Askold,	German Coach.
558	L. E. Bolopue,	Blanchard,	Sacy,	Percheron.
915	W. P. Catherman,	Millheim,	Wilber B,	Percheron.
859	John H. Detwiler,	Centre Hall,	Nickabon,	Standardbred.
518	French Coach Horse Co.,	Bellefonte,	Vigoreux,	French Coach.
818	Irvin G. Gray,	Stormstown,	McKinely,	Percheron.
440	Percheron Horse Co.,	Bellefonte,	Craintiff,	Percheron.
67	W. F. Rishel,	Spring Mills,	Edgemont Bellevue,	Percheron.
610	McC. Rossman,	State College,	Colbert,	Percheron.
37	John C. Rossman,	Centre Hall,	Allen Chide,	Standardbred.
806	H. A. Scholl,	Fleming,	Bayard,	Percheron.
449	State College Horse Co.,	State College,	Voltigeur,	Percheron.
587	Valley Horse Co.,	Rebersburg,	Galtas,	Percheron.

Chester County.

169	H. C. Bailey,	Downingtown,	Haussey,	Percheron.
201	Jas. A. Bicking,	E. Downingtown,	Ethan Direct,	Standardbred.
232	E. Kirk Brown,	Nottingham, R. D. No. 2,	Marlbori Patchen,	Standardbred.
347	E. B. Cassatt,	Berwyn,	Aeronaut,	Thoroughbred.
348	E. B. Cassatt,	Berwyn,	Liberty,	Hackney.
443	Chas. Chambers,	Supplee,	Conversano,	Standardbred.
18	Edwin Chambers,	Oxford, R. D. No. 5,	Marengo,	Percheron.
320	Alfred Clements,	New Centreville,	Bohemian Glass,	Thoroughbred.
838	Wm. J. Clothier,	Phoenixville,	Legerdemain,	Thoroughbred.
25	A. B. Coxe,	Paoli,	De Coronada,	Standardbred.
579	A. B. Criswell,	Cochranville,	Wheeler W.,	Standardbred.
516	Walter S. Donlin,	Downingtown,	Rondo Bell,	Standardbred.
512	Maurice Hickey,	Lincoln University,	Hengist,	Hackney.
55	S. E. Howell,	West Chester,	Diplomat,	German Coach.
820	W. H. Kennedy,	Downingtown,	Letort,	Standardbred.
107	Wm. Kerr,	Downingtown,	Jack Storts,	Standardbred.
639	Enos McCardle,	West Chester,	King Carter,	Thoroughbred.
717	Harry J. McFarlan,	Downingtown,	Pedant,	Orloff.

251	David Mackey,	Oxford,	U. G. Caldwell,	Standardbred.
86	Jas. M. McCamant,	West Chester,	Ashland Dewey,	Standardbred.
703	Chas. E. Mather,	West Chester,	Adab,	Thoroughbred.
704	Chas. E. Mather,	West Chester,	Kilogram,	Thoroughbred.
225	Geo. B. Mellor, Jr.,	West Chester,	C. L. B. (Burcine),	Standardbred.
40	L. B. Miller,	Kelton,	Ashlancer,	Standardbred.
214	Robert Moore,	Glen Moore, R. D. No. 3,	Litlo,	Percheron.
559	New London Belgian Draft Horse Association,	Lincoln University,	Jean de Jur,	Belgian.
607	Henry Palmer,	Avondale,	Sisalson,	Standardbred.
688	Thos. J. Phipps,	Uwchland,	Wheeler F,	Standardbred.
357	H. W. Reed & Bros.,	Cochranville,	Janleo,	Percheron.
506	Elmer T. Sellers,	Kennett Square,	Texas Don,	Standardbred.
598	D. B. Sharp,	Berwyn,	Master of Craft,	Thoroughbred.
597	Thos. E. Smedley,	Anselma,	Shadeland Lemont,	Percheron.
921	A. D. Spencer,	Koalin,	Batiste,	French Coach.
3	Thos. B. Snyder,	Phoenixville, R. D. No. 4,	Medium,	Percheron.
4	Thos. B. Snyder,	Phoenixville, R. D. No. 4,	Dellam,	Standardbred.
872	Ben. M. Stoltzfus,	Elverson,	Ture,	Percheron.
60	Harry C. Thomas,	Oxford,	Wheelin,	Standardbred.
808	Ed. W. Twadell,	Westtown,	Rickell II,	Hackney.
809	Ed. W. Twadell,	Westtown,	Tevis' Kentucky,	Jack.
222	Wm. White,	New Centreville,	Oxford,	Hackney.
884	R. W. Wickersham,	Russellville,	Hal Dale,	Standardbred.
158	Silas Wright,	West Chester,	Gay Harry,	Standardbred.

Clarion County.

9	R. A. Agey,	Shippenville,	Medium Gazette,	Standardbred.
15	J. P. Bartlett,	New Bethlehem, R. D. No. 3,	Crown Prince,	Percheron.
298	N. C. Brock,	Rimersburg,	Wildair,	Shire.
69	J. M. Buzard,	Strattonville,	Joli de Roulers,	Belgian.
825	C. E. Cummings,	Strattonville,	Cyrus,	Belgian.
94	R. H. Edmonson,	Sligo,	Richard Tell,	Standardbred.
285	J. H. Exley,	Knox,	Jules,	Percheron.
473	F. B. Fidler and H. C. McClain,	Clarion,	Duke,	Percheron.
236	C. J. Henry,	New Bethlehem,	Prosper,	Percheron.
176	W. H. King,	Lawsonham,	Pharo,	Belgian.
177	W. H. King,	Lawsonham,	Rival d'King,	Belgian.
62	Lauer & Beary,	Marble,	Superbe,	Percheron.
252	J. T. Magan,	Rimersburg, R. D. No. 2,	Toreador,	Percheron.
146	New Bethlehem Horse Co.,	New Bethlehem, R. D. No. 1,	Nantais,	Percheron.
130	Sligo Hackney Horse Association,	Sligo,	Fitzduke,	Hackney.
767	I. M. Shannon,	Clarion,	Norward,	Standardbred.
768	I. M. Shannon,	Clarion,	Monarch,	French Draft.
375	S. C. Stewart,	Lawsonham,	Success,	Shire.
479	Geo. Youkers,	Elk City,	Destin,	Percheron.

Clearfield County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
119	Frank Hahne,	DuBois,	Dubois,	Percheron.
57	John H. Patchen,	Burnside,	Ralph Cole,	Standardbred.
65	G. Wesley Smeal,	West Decatur,	Emandus,	German Coach.

Clinton County.

88	B. C. Dottere,	Mill Hall, R. D.,	Duke,	Percheron.
97	I. S. Frain,	Mill Hall,	Creston,	Percheron.
602	Nittany Valley Percheron Horse Co.,	Lock Haven,	Minntieux,	Percheron.
724	Ricker Bros.,	Lock Haven,	Printz,	Percheron.
5	Henry W. Shoemaker,	McElhattan,	Bonnie Dundee,	Saddle.
42	Henry W. Shoemaker,	McElhattan,	Antioneer,	Standardbred.
140	Henry W. Shoemaker,	McElhattan,	Go Between,	Thoroughbred.
160	Henry W. Shoemaker,	McElhattan,	Firm,	Thoroughbred.
131	George Smith,	Loganton,	Sultan,	Percheron.
711	H. J. S. Weicksel.	Lock Haven,	Paxinos,	Standardbred.

Columbia County.

360	D. J. Donovon,	Benton,	Harder,	German Coach.
519	T. E. Hyde,	Bloomsburg,	Herve Reil,	Percheron.
520	T. E. Hyde,	Bloomsburg,	Sildare,	Standardbred.
389	Millville Percheron Horse Co.,	Millville,	Prefere,	Percheron.
789	Newill & Benford,	Mill Run,	Scottdale,	Percheron.
750	Harvey Shaffer,	Bloomsburg,	Stockton Hero,	Clydesdale.
337	J. E. Shultz,	Berwick,	Senator Mack,	Clydesdale.
916	M. E. Stackhouse,	Bloomsburg,	Aeolian,	Standardbred.
429	B. H. Yohe,	Bloomsburg,	Direct Hal, Jr.,	Standardbred.

511	F. E. Aspey,	Saegerstown,	Cyrus,	German Coach.
163	W. L. Blakeslee,	Spartansburg,	Black Prince,	Percheron.
881	W. L. Blakeslee,	Spartansburg,	Leo,	Percheron.
274	Godfrey Brush,	Geneva,	Paris,	Percheron.
494	C. C. Burrows,	Spartansburg,	Chicago,	Percheron.
823	W. D. Campbell,	Hydetown,	Candor,	Percheron.
442	C. A. Cole,	Conneaut Lake,	Colegrove,	Percheron.
210	Conneaut Lake Percheron Horse Co.,	Conneaut Lake,	Courtisan,	Percheron.
584	Conneautville Belgian Horse Co.,	Conneautville,	Caeser de Ghoy,	Belgian.
756	Conneautville Hackney Horse Co.,	Conneautville,	Bradney Ambition,	Hackney.
550	H. O. Dreutlein,	Meadville,	Count Wiggins,	Standardbred.
900	John Eastman,	Spartansburg,	Fred,	Percheron.
489	John Free,	Shermansville,	Gaillard,	Percheron.
682	A. M. Gorman,	LaJose,	Danehy,	Shire.
71	O. D. Hanks,	Meadville,	Dacoma,	Percheron.
297	W. M. Hart,	Cochranton,	Botha,	Percheron.
552	Frank H. Herrington,	Meadville, R. D. No. 5,	Superbus,	Percheron.
433	Homer R. Howe,	Titusville,	Glou Glou,	Percheron.
850	Lyman Hunter,	Hartstown,	Airship,	Hackney.
851	Lyman Hunter,	Hartstown,	Keo to Saul,	Percheron.
852	Lyman Hunter,	Hartstown,	Highland Birdell,	Percheron.
295	Martin Jackson,	Harmonsburg,	Effendi,	German Coach.
912	Geo. D. King,	Springboro,	King Philip,	French Coach.
381	Grove G. Lewis,	Hartstown,	Colonel Breckenridge.	Percheron.
611	Little Missouri Horse Co.,	Meadville,	Urray,	Percheron.
41	Jas. McFaydean,	Conneautville,	Brillian H,	Percheron.
63	Wm. McQuiston,	Atlantic,	Favori,	Percheron.
622	Meadville French Coach Horse Co.,	Meadville,	Argent,	French Coach.
748	John Minne'ey,	Meadville,	Thorn Hal,	Standardbred.
481	Penn Line Horse Breeders' Association,	Conneautville,	Castillon,	Percheron.
376	J. E. Philips,	Hartstown,	Hammed,	Belgian.
887	Powell Bros.,	Shadeland,	Shadeland Othello,	Percheron.
888	Powell Bros.,	Shadeland,	Shadeland Hebron,	French Coach.
889	Powell Bros.,	Shadeland,	Wakiva,	Standardbred.
890	Powell Bros.,	Shadeland,	Shadeland Moulton,	Percheron.
891	Powell Bros.,	Shadeland,	Shadeland Adbell,	Standardbred.
892	Powell Bros.,	Shadeland,	Shadeland Vinlear,	Standardbred.
643	J. V. Prather,	Titusville,	Shadeland Quartowilkes,	Standardbred.
578	Harry E. Ross,	Centreville,	Sultan,	Percheron.
650	Forest Russell,	Townville,	Keno Morgan,	Morgan.
459	L. L. Shreve,	Spartansburg,	Rouche,	Percheron.
829	M. R. Smith,	Cambridge Springs, R. D.,	The Prince Albert,	Standardbred.
600	O. D. Sperry,	Cambridge Springs,	Zoo Loo,	Percheron.
311	H. M. Stanford,	Saegerstown,	Halcyon Bells,	Standardbred.
750	F. A. Sutton,	Meadville,	Black Beauty,	Shire.

Crawford County—Continued.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
751	F. A. Sutton,	Meadville,	Yucca III,	Percheron.
692	A. Q. Thompson,	Conneautville,	Miramar,	French Coach.
283	J. E. Van Sicklin,	Linesville,	Harbor Star,	Welsh Pony.
812	Ross Wetzel,	Cochranton,	Bristol,	Belgian.
592	Thos.' E. White,	Westford,	Beauty's Prince,	Clydesdale.

Cumberland County.

667	M. G. Albright,	New Kingston,	Major II de Beauvois,	Belgian.
123	Theo. Jumper,	Carlisle,	Certain,	Belgian.
759	W. L. Karper,	Shippensburg,	Pilot The General,	Standardbred.
715	Elmer E. Lay,	Carlisle,	Sterling,	Standardbred.
249	Newville Percheron Horse Co.,	Newville,	Tsipide,	Percheron.
735	J. A. Sharp,	Shippensburg,	Coco Cola,	Non Standard.
92	John L. Shelly,	Mechanicsburg,	Wilnut,	Standardbred.
410	Shippensburg Horse Co.,	Shippensburg,	Halp,	Percheron.

Dauphin County.

817	J. H. Oyler,	Harrisburg,	Barito,	Standardbred.
60	Vance C. McCormick,	Harrisburg,	Hoche,	Percheron.
356	Upper Dauphin German Coach Horse Co.,	Berryville,	Memphis,	German Coach.

Delaware County.

91	John Y. Calvert,	Newtown Square,	Ballinger,	Percheron.
944	John P. Crozer,	Upland,	Abere,	Percheron.
103	H. H. Darlington and H. Garrett,	Concordville,	Auster,	Non Standard.
104	H. H. Darlington and H. Garrett,	Concordville,	Canby Chimes,	Standardbred.
854	J. L. Rumbarger,	Sharon Hill,	William Buck,	Standardbred.
909	Wm. J. Watson,	Wayne,	Polonius Younger,	Hackney.

Elk County.

(Nothing Registered.)

Erie County.

835	F. I. Adams,	Corry,	Royal Tom,	Shire.
836	F. I. Adams,	Corry,	Victor,	Shire.
871	D. H. Alden,	Elgin,	Narses,	German Coach.
309	John Bancroft,	Waneta,	Brilliant Bob,	Percheron.
641	H. S. Bennett,	Union City, R. D. No. 2,	Toxique,	Percheron.
2	Guy Blakeslee,	Corry,	Donald,	Percheron.
841	Fred Caflisch,	Union City,	New Forest King,	Hackney.
268	Jas. M. Colegrove,	Corry, R. D. No. 1,	Empire,	Percheron.
765	C. A. Davis,	Union City,	King Quett,	Standardbred.
766	C. A. Davis,	Union City,	Attu,	Standardbred.
17	Ed. Deriar,	Albion,	Sutnteny Brassey,	Shire.
662	Erie Shire Horse Co.,	Erie, R. D. No. 6,	Shipton Paxton,	Shire.
940	C. P. Fish,	Waterford,	Lord Roberts,	Clydesdale.
548	French Coach Horse Co.,	Erie,	Massener,	French Coach.
282	A. L. Graver,	Fairview,	Vercingetorix,	French Coach.
391	M. V. Gleeten,	Edinboro,	Colonel Jack,	Percheron.
335	U. G. Harwood,	Wattsburg,	Jack McCall,	Clydesdale.
833	J. W. and A. P. Howard Co.,	Corry,	Pat Anakin,	Standardbred.
89	L. L. Hubbard,	Erie, R. D. No. 1,	King Bingen,	Standardbred.
411	Jas. G. Humes,	Union City, R. D. No. 3,	Shadeland Quinton,	Percheron.
632	Reed T. Hunt,	Waterford,	Aster,	Shire.
173	J. B. Irons,	Erie,	Red Snowden,	Standardbred.
707	J. J. McClenathan,	Edinboro,	Calino,	Percheron.
609	L. D. Mallory,	Albion,	Paris,	Percheron.
567	E. G. Mitchell,	Waterford,	Hane,	Percheron.

Erie County—Continued.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
568	E. G. Mitchell,	Waterford,	Insouciant,	Belgian.
569	E. G. Mitchell,	Waterford,	Amberfield Whats Wanted,	Shire.
364	Loven Phelps,	Wattsburg,	Norris,	Percheron.
314	G. E. Tuckey,	Girard,	Dartford,	Standardbred.
840	Union Shire Horse Co.,	Union City,	Hoylake Menstral,	Shire.
79	Henry Veith,	McKean,	Titus,	Percheron.
874	P. H. Wait,	Waterford,	Laciec,	Non Standard.
784	J. E. Wolf,	Fairview,	Prince Napoleon,	Percheron.

Fayette County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
655	M. H. Cloud,	Masontown,	Wahlman,	German Coach.
260	Dawson Park Farm,	Dawson,	Allurian,	Standardbred.
32	Jonah M. Dearth,	New Salem,	McDonald King,	Saddle.
361	J. H. Dils,	New Geneva,	Serpolet,	Percheron.
155	German Township Horse Co.,	Fairbank,	Craquer,	Percheron.
213	Ira M. Gregg,	S. Brownsville,	Backman Boy,	Standardbred.
493	Z. H. Jackson,	New Salem,	Rapin,	Percheron.
731	J. B. Keener,	New Salem,	Mignon,	Belgian.
35	J. B. Keener,	New Salem,	Sadi d'altere,	Belgian.
828	Austin Livingston,	Vanderbilt,	Craeker,	Shire.
654	Masontown Horse Co.,	Masontown,	Suspect,	Percheron.
482	Jas. H. Miller,	Indianhead,	Glacier,	Percheron.

Forest County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
870	Forest County Percheron Horse Co.,	Tionesta,	Serpentine,	Pereheron.

Franklin County.

168	Brindle & Ommeret,	Mercersburg,	Brilliant,	French Draft.
638	S. M. Brubaker,	Lemasters,	Lessing,	Percheron.
90	Culbertson Horse Co.,	Greenvillage,	Kimmel,	Belgian.
676	W. F. Hartman,	Greencastle, R. D. No. 2,	Lexicon,	Percheron.
763	David F. Hays,	Greencastle, R. D. No. 4,	Infernal Bee,	Standardbred.
171	M. M. Kauffman,	Chambersburg, R. D. No. 1,	Ashland Crow,	Standardbred.
477	G. C. Kline,	Mont Alto,	Benny,	Percheron.
744	John R. Lashley,	Waynesboro,	Westline,	Standardbred.
526	Benjamin Lehman,	Chambersburg, R. D. No. 1,	Kansas Lad,	Percheron.
224	J. B. Martin,	Greencastle,	Colonel,	Percheron.
856	E. R. Meyers,	Mercersburg,	Indoustan,	Percheron.
383	E. R. Meyers,	Mercersburg,	Leroy,	Percheron.
384	E. R. Meyers,	Mercersburg,	Jupiter de Nyt,	Belgian.
385	E. R. Meyers,	Mercersburg,	Gas Bel,	Standardbred.
447	D. S. Miller,	Waynesboro, R. D. No. 2,	Letroy,	Percheron.
754	John F. Mish,	Mercersburg,	Glenfield,	Standardbred.
251	Ed. Nicodemus,	Waynesboro, R. D. No. 2,	Insensible,	Percheron.
409	Niswander & King,	Greencastle,	Shellmeg, Jr.,	Standardbred.
603	John W. Potter,	Greencastle,	Leroy,	Percheron.
793	J. G. Rahauser,	Greencastle,	Infernal,	Standardbred.
70	J. W. Rahauser,	Shady Grove,	Fernal B,	Standardbred.
545	J. W. Reed,	Pleasant Hall,	Glen Earl,	Standardbred.
352	J. N. Ricker,	Mercersburg,	Gaston de Horrues,	Belgian.
478	John B. Schlichter,	Chambersburg,	Franconi,	Belgian.
255	Scotland Horse Co.,	Scotland,	Goigard,	Percheron.
187	D. E. Sellers,	Wingerton,	Billy Stone,	Standardbred.
721	Geo. O. Stine,	Mercersburg,	Marquis de Stac,	Belgian.
722	Geo. O. Stine,	Mercersburg,	Gavrocket,	Percheron.
897	C. M. Strickler,	Greencastle,	Ross S,	Percheron.
898	C. M. Strickler,	Greencastle,	Lanarat,	Standardbred.
899	C. M. Strickler,	Greencastle,	Electric Gift,	Standardbred.
491	S. S. Widney,	Doylesburg,	Floyd,	Percheron.
492	S. S. Widney,	Doylesburg,	Mystinal,	Standardbred.
794	John F. Wilkinson,	Mont Alto,	Adino Sprague,	Standardbred.
517	J. B. Zimmerman,	Mercersburg,	Alexander,	Percheron.

Fulton County.

533	L. L. Grissinger,	McConnellsburg,	Major,	Percheron.
49	J. J. Hendershott,	Lashley,	Fulton Price,	Percheron.
406	D. A. Nelson and J. H. Kendall,	McConnellsburg,	Grenadier,	Belgian.
896	George Wilds,	Fort Littleton,	Boccaccio,	Percheron.

Greene County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
802	C. H. Andrew,	Deer Lick,	Herview,	Percheron.
150	J. H. Bell,	Jefferson,	Ieg,	Standardbred.
244	C. E. Bowers,	Kirby,	Hal Mac,	Standardbred.
762	Patrick J. Bradley,	Waynesburg,	Redlands,	Standardbred.
693	S. C. Chess,	Harveys,	Franziskus,	German Coach.
50	W. F. Dorsey,	Carmichaels,	Royal Buckner,	Standardbred.
51	W. F. Dorsey,	Carmichaels,	Belgian Prince,	Belgian.
658	J. F. Flenniken,	Carmichaels,	Locket,	Thoroughbred.
247	J. L. Gribben,	Harveys,	Tedy,	Percheron.
182	J. R. Hawkins,	Clarksville,	Slocum,	Belgian.
108	Geo. Huffman,	Harveys,	Lighteap,	Standardbred.
614	Geo. Huffman,	Harveys,	Manfred,	Standardbred.
164	T. Riley Huffman,	Waynesburg,	Triton,	Percheron.
616	W. L. Ingraham,	Waynesburg,	Highcliffe,	Standardbred.
554	T. R. Kinney,	Harveys,	Denton St. Leonard,	Shire.
284	C. E. Lantz,	Carmichaels,	Specimen,	Percheron.
1	Samuel Lemely,	Fordyce,	King, Jr.,	Shire.
507	Wm. M. Lemmon,	Sand Rock,	Barabas,	Percheron.
620	G. E. Loughman,	Sycamore,	Rubis,	Percheron.
656	E. D. Mapel,	Waynesburg,	Coldeye,	Morgan.
788	J. A. Mapel & Son,	Waynesburg,	Don Keo,	Standardbred.
774	J. A. Maple,	Waynesburg,	Maxie,	Standardbred.
775	J. A. Maple,	Waynesburg,	Casko,	Standardbred.
415	Morris & Jones,	Pine Bank,	Admiral,	Percheron.
629	Jos. B. Reeves,	Carmichaels,	Goldlock,	Morgan.
630	Jos. B. Reeves,	Carmichaels,	Gold Standard,	Morgan.
192	F. O. Rinehart,	Waynesburg,	Robert Wilson,	Standardbred.
560	Jeee L. Ross,	Waynesburg,	Elden B,	Standardbred.
781	John G. Rinehart,	Waynesburg,	Preston Boy,	Saddle.
877	J. W. Stewart,	Jefferson,	Master Builder,	Standardbred.
292	W. A. Titus,	Waynesburg,	Roy Moquette,	Standardbred.
221	Ullom Bros.,	Aleppo,	Good Quality,	Clydesdale.
615	John H. Yoders,	Clarksville,	Calumet,	Percheron.

Huntingdon County.

683	W. H. Bogg,	Huntingdon,	Albert Bellini,	Standardbred.
416	Huntingdon Furnace Percheron Horse Co.,	Warriors Mark,	Gansard,	Percheron.
681	Wm. G. Kenaga,	Alexandria,	Prince Chimes,	Standardbred.
583	Knode Bros.,	Alexandria,	Consul,	French Draft.
382	W. H. Johnson,	Dudley,	Woodford Foret Denmark,	Saddle.
438	John M. Miller,	Entriken,	Ibsen,	German Coach.
911	H. P. Reynolds,	Aitch,	Incongru,	Percheron.

Indiana County.

743	D. H. Anderson,	Creekside,	Grover,	Percheron.
483	Armagh Percheron Horse Co.,	Armagh,	Tambour,	Percheron.
824	A. P. Baker,	Blairsville,	Reveur,	Percheron.
669	M. B. Billingsee,	Blairsville,	Hudson Choice,	Shire.
599	L. H. Boucher,	Lovejoy,	Araphoe,	Percheron.
435	P. H. Bowers,	Big Run,	John,	French Draft.
485	H. S. Carroll,	Plumville,	Favora,	Percheron.
84	Grant Crosnum,	Cherry Tree,	Tudue,	Percheron.
612	David Edwards,	Indiana,	Thorn King,	Standardbred.
879	David Edwards,	Indiana,	Ohio King,	Shire.
880	David Edwards,	Indiana,	Caeser,	French Draft.
680	W. J. Farnsworth,	Marion Centre,	Civitis,	Standardbred.
340	W. C. Freese,	Lovejoy,	Prince Albert,	French Draft.
299	John Fulmer,	Indiana,	Clayton,	French Draft.
174	Emanuel Hawk,	Home,	Prince,	Percheron.
505	Geo. Helman,	Saltsburg,	Royhurst,	Standardbred.
233	George R. Kinnan,	Elkin,	Duke,	French Draft.
374	Samuel Miller,	Shelocta,	Lessing,	German Coach.
432	D. W. Raraigh,	Plumville,	Regent,	French Coach.
771	J. M. St. Clair,	Indiana,	Cromwill,	Standardbred.
235	H. P. Sandles,	Clarksburg,	Brilliant,	Percheron.
341	R. M. Sell,	Shelocta,	Fritz,	French Draft.
191	R. H. Thompson,	Home,	Gilson,	Shire.
604	S. S. Wetzel,	Marion Centre,	Edison,	Percheron.
258	M. B. Wynkoop,	Marion Centre,	Gomeur,	Percheron.

Jefferson County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
513	Brockwayville Percheron Horse Breeding Association.	Brockwayville,	Panama,	Percheron.
885	Calhoun Bros.,	Brockwayville,	Fitz Dane,	Hackney.
452	W. G. Edelblute,	Punxsutawney,	Fairman,	Standardbred.
453	W. G. Edelblute,	Punxsutawney,	King Joe,	Standardbred.
645	R. A. Elkin,	Horatio,	Paul,	Percheron.
646	R. A. Elkin,	Horatio,	Black Cal,	French Draft.
635	W. J. Kuntz,	Brookville,	Handsome,	Percheron.
249	Elias Neece,	Dora,	Cupid,	Shire.
250	Elias Neece,	Dora,	Jules,	Percheron.
212	R. E. Reitz,	Brookville,	Lubin,	Percheron.
590	Reynoldsville Percheron Horse Co.,	Reynoldville,	Papillon,	Percheron.
112	J. L. Simpson,	Corsica,	Sire Pociess,	Percheron.
533	S. J. Stahlman,	Brookville,	Pagoda Chief,	French Draft.

Juniata County.

25	Samuel B. Crawford,	McCoysville,	Haute,	Percheron.
114	Jos. P. Ernest,	Mifflintown,	UtDiese,	French Coach.
85	N. K. Johnson,	Port Royal,	Rubrican,	Standardbred.
120	S. P. Leyder,	VanDyke,	Salm,	German Coach.
465	Jas. M. Thompson,	East Waterford,	Hucket,	Percheron.

Lackawanna County.

918	Geo. W. Dunn,	Scranton,	Mataphan,,	Standardbred.
906	G. W. Howe,	Jermyn,	Black Hawk Harry,	Morgan.
910	H. S. Pierce,	Carbondale,	Lou Dismount,	Standardbred.
922	Geo. E. Stevenson & Sons,	Waverly,	Samano,	Percheron.

Lancaster County.

428	H. K. Blough,	Elizabethtown,	Stormer B,	Standardbred.
464	Columbia German Coach Horse Breeders' Assn.,	Columbia,	Orlow,	German Coach.
547	I. N. Gluck,	Lancaster,	Welcome,	Percheron.
144	John G. Hall,	New Providence,	Sigvard,	Hackney.
83	Amos S. Hess,	Gap,	Prince,	Percheron.
209	J. B. Hershey,	Manheim,	Uncle Josh,	Standardbred.
33	H. H. Kauffman,	Lancaster,	Dynamic,	Standardbred.
882	Cyrus S. Kline,	Manheim,	Josh, Jr.,	Standardbred.
407	Will Leber,	Ephrata,	Kapolona,	Standardbred.
927	R. P. McGrann,	Lancaster,	First Chord,	Thoroughbred.
928	R. P. McGrann,	Lancaster,	Dilham Prime Minister,	Hackney.
929	R. P. McGrann,	Lancaster,	Danesfort,	Hackney.
930	R. P. McGrann,	Lancaster,	Manxman,	Hackney.
931	R. P. McGrann,	Lancaster,	Nipperfort,	Hackney.
932	R. P. McGrann,	Lancaster,	Grand View Sultan,	Hackney.
534	W. A. Scott,	Octoraro,	Bois Joly,	Percheron.
822	John R. Sigle,	Gordonville,	Prince of Quality,	Percheron.
392	J. D. Smith,	Rheems,	Jay D. S.,	Standardbred.
80	Grant Steinmetz,	Clay,	Grand View Spinner,	Hackney.
127	Ira Stewart,	Quarryville,	Archideus,	German Coach.
684	Elmer and W. Stoltzfus,	Gap,	Young Tenis,	Percheron.
205	Jas. H. Swain,	Lancaster,	Director Moore's First,	Standardbred.
914	N. B. Witman,	Fulton House,	The Terror,	Standardbred.

Lawrence County.

93	Cameron & Gibson,	Edinburg,	Croiseur,	Percheron.
718	J. L. Cochran,	Volant,	Dandy Line,	Standardbred.
316	Cooper & Burton,	East Brook,	Bracelot,	Percheron.
317	Cooper & Burton,	East Brook,	Barnum de Claquebois,	Belgian.
318	Cooper & Burton,	East Brook,	Clarion de Croix,	Belgian.
827	Ed. K. Cover,	Pulaski,	Mars Chief,	Percheron.
745	Crawford Horse Co.,	New Wilmington,	Papillon,	Percheron.
543	Emanuel Byer,	Pulaski,	Partisan,	Percheron.
627	J. P. Evans,	New Castle,	Chartrain,	Percheron.
332	C. Dale Fullerton,	Edinburg,	Argus de Jor,	Belgian.
315	J. W. Green,	New Castle,	Macy Clay,	Standardbred.
29	Henry Grotefend,	New Castle,	Robert Directum,	Standardbred.
30	Henry Grotefend,	New Castle,	Black Allerton,	Standardbred.
490	Frank H. Honk,	Elwood City,	Krugar,	Percheron.
689	J. S. Johnson,	New Castle,	Lonzo Vincent,	Standardbred.

Lawrence County—Continued.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
690	J. S. Johnson,	New Castle,	St. Edward,	Standardbred.
544	Saul Kaufman,	New Castle,	Cleopaz,	Percheron.
921	S. C. McCreary,	New Wilmington,	Uzel,	French Coach.
893	Robert McKee,	New Castle,	Courageous,	Percheron.
327	F. E. Moore,	Pulaski,	Humbert,	Percheron.
328	F. E. Moore,	Pulaski,	Sunny Jim,	Shire.
935	J. J. W. Morrow,	New Castle,	Vintell,	Standardbred.
528	J. J. W. Morrow,	New Castle,	The Orator,	Standardbred.
581	Isaac Newton,	New Castle,	High Opera,	Standardbred.
135	S. P. Penberthy and L. C. Barry,	New Castle,	Bataclan,	Percheron.
136	S. P. Penberthy and L. C. Barry,	New Castle,	Baron de Zulte,	Belgian.
134	S. P. Penberthy and C. W. Wettick,	New Castle,	King Sultan,	Standardbred.
742	S. H. Shaw,	New Castle,	Hustler,	Standardbred.
500	J. H. Tucker,	New Castle, R. D. No. 4,	Flosko,	Standardbred.
179	J. H. Turner & Son,	New Castle, R. D. No. 4,	Birrh,	Percheron.
180	J. H. Turner & Son,	New Castle, R. D. No. 4,	Peter Crawford,	Clydesdale.
181	J. H. Turner & Son,	New Castle, R. D. No. 4,	Israel,	Percheron.
223	J. H. Turner & Son,	New Castle,	Baron d'Hustle,	Belgian.
634	R. W. Wellar,	New Castle,	Colonel,	Standardbred.
536	T. A. White,	New Castle,	Home Spun,	Percheron.
537	T. A. White,	New Castle,	Take Care, Jr.,	Standardbred.
538	T. A. White,	New Castle,	Doc Covert,	Standardbred.
499	S. W. Wilson,	Wampum,	Nero,	Percheron.

Lebanon County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
43	E. J. Albert,	Lebanon,	College Master,	Standardbred.
56	J. N. Becker,	Palmyra,	Andre L,	French Coach.
137	R. G. Hynicka,	Lebanon,	McMahon,	German Coach.
238	B. F. Lineweaver,	Campbellstown,	Graf,	German Coach.
867	Wm. B. Means,	Lebanon,	Barosnin,	Standardbred.

848	Wm. B. Means,	Lebanon,	Bonnie Ashland,	Standardbred.
77	Nathan A. Miller,	Lebanon,	Ashland Cord,	Standardbred.
457	F. B. Witmer,	Bismarck,	Bismarck Boy,	Standardbred.

Lehigh County.

34	Bloss & Loy,	New Tripoli,	Goldjunge,	German Coach.
151	Geo. F. Carter,	Emaus,	Ashland Carter,	Standardbred.
345	John H. Keiffer,	Allentown,	Chanuka,	Standardbred.
613	W. J. Merkle,	Allentown,	Chatelet,	Percheron.
710	J. Geo. Snyder & Co.,	Allentown,	Courtland,	Percheron.
301	C. D. Werley and W. H. Snyder,	Jordon,	Captain Weddell,	Standardbred.
165	C. D. Werley,	Jordon,	Tennessee McGregor,	Standardbred.

Luzerne County.

230	Conyngham Bros.,	Wilkes-Barre,	The Diamond Royal,	Clydesdale.
197	Conyngham Bros.,	Wilkes-Barre,	Rundlesham Sunshine,	Suffolk.
288	Grand View Stock Farm,	Huntington Mills,	Governor Hastings,	Standardbred.
446	Torrence and Fred Nangle,	Hunlock Creek,	Alton,	Percheron.
439	S. W. Post,	Sweet Valley,	American Hero,	Cleveland Bay.
148	W. W. Van Demarck,	Wilkes-Barre,	Petrie,	French Draft.
883	Chas. Sickler & Son,	Wilkes-Barre,	Impractical,	Standardbred.

Lycoming County.

133	A. G. Fry,	Pennsdale,	Souvenir, Jr.,	Percheron.
324	E. J. Lore & Co.,	Hughesville,	Brilliant,	Percheron.
325	E. J. Lore & Co.,	Hughesville,	Mentor,	Belgian.
59	Muneh Horse Co.,	Muncy,	Findorf,	German Coach.

McKean County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
68	W. H. Barlett,	Kane,	Baron Arnaud,	Standardbred.
549	Bradford Percheron Horse Co.,	Bradford,	Gaul,	Percheron.
896	Geo. Burnham,	Eldred,	Historian,	Percheron.
725	J. E. Cass,	Kane,	Freitag,	German Coach.
355	F. E. Cleveland,	Smethport,	Monarch,	Percheron.
110	B. C. Gallup,	Pt. Allegheny,	Erie B,	Standardbred.
336	Chas. McElwee,	Pt. Allegany,	Togo,	Percheron.
99	Port Allegany Horse Co.,	Pt. Allegany,	Elderado,	Percheron.

Mercer County.

215	A. A. Anderson and A. J. McMillen,	West Middlesex,	Southview Lord,	Percheron.
729	A. L. Axtell,	Mercer,	Milo M,	Standardbred.
730	A. L. Axtell,	Mercer,	George Ade,	Clydesdale.
731	A. L. Axtell,	Mercer,	Monet,	Percheron.
273	D. A. Baker,	Mercer,	Jupin,	Percheron.
508	Samuel Baker,	Jackson Centre,	Monarch,	Clydesdale.
413	A. H. Bennett,	Greenville,	Philip,	Percheron.
944	B. Bowers & Son,	Greenville,	Jim Hosack,	Standardbred.
617	A. J. Buchanan & Son,	Grove City,	Souvenir de Wodecq,	Belgian.
365	A. J. Buchanan,	Grove City,	Sultan,	Percheron.
938	Harvey V. Byerly,	Sharpsville,	Can Sielen,	Standardbred.
795	Wm. Chess,	Mercer,	Black Brilliant,	Percheron.
796	Wm. Chess,	Mercer,	Cedar A Hall,	Standardbred.
687	Currier & McMillen,	Sandy Lake,	Red Gaunt,	Standardbred.
813	J. B. Curry,	Clarks Mills,	Rall Sultan,	Standardbred.
814	J. B. Curry,	Clarks Mills,	Madere d'appel,	Belgian.
237	A. M. Dickson,	Sandy Lake,	Brilliant,	Percheron.
472	Peter Dinehart,	Greenville,	Frank Halford,	Standardbred.
672	S. L. Egbert,	Sandy Lake,	Keoto Judge,	Percheron.
673	S. L. Egbert,	Sandy Lake,	Yucca III,	French Draft.
674	S. L. Egbert,	Sandy Lake,	Scottish Mint,	Clydesdale.

675	S. L. Egbert,	Sandy Lake,	Carter V,	Standardbred.
310	W. H. Flock,	Jamestown,	Bajmon Zerbehaye,	Belgian.
334	David Free,	Hadley,	Bovard,	Percheron.
227	C. J. Gamble,	Transfer,	Bismuth de Lobbes,	Belgian.
691	R. A. Hannah,	Sharon,	Valdemar,	Percheron.
430	C. K. Hawthorne,	Mercer,	King Wade,	Standardbred.
522	Chas. A. Ifft,	Slippery Rock,	Luzon,	Percheron.
726	J. L. Linn,	Greenville,	Black Prince,	Percheron.
773	R. B. McCoy,	Mercer,	Breissand II,	Percheron.
450	R. H. McDowell,	Grove City,	Mt. Shasta,	Standardbred.
869	H. K. McElrath & Barnes,	Jackson Centre,	Dandy Cub, Jr.,	Morgan.
594	Mercer Co. Hackney Association,	Mercer,	Wharram Matchless,	Hackney.
593	Mercer Co. Breeding Association,	Mercer,	Glencairn,	Clydesdale.
178	W. H. Mertz,	Sharpsville,	Leo,	German Coach.
649	John C. Moates,	Jamestown,	Prince Albert,	Percheron.
386	S. S. Montgomery,	Jackson Centre,	Monarch,	Percheron.
778	Wm. Paden,	Greenville,	Bailli,	Percheron.
304	Leon Patton,	Sandy Lake,	Hercules III,	Percheron.
305	Leon Patton,	Sandy Lake,	Sevillian,	Standardbred.
810	G. W. Pearson,	Jackson Centre,	Colonel,	Shire.
811	G. W. Pearson,	Jackson Centre,	Prince Charles,	Shire.
976	Powell Bros. and E. A. Borland,	Clarks Mills,	Shadeland Onward,	Percheron.
904	W. S. Reinhart,	Transfer,	Lamar,	Percheron.
574	W. S. Reinhart,	Transfer,	Valespir,	French Draft.
521	G. E. Smith,	Mercer,	The Gladiateur,	Percheron.
939	H. M. Snider,	Hadley,	Jacquot,	Percheron.
116	Aaron Sowers,	Mercer No. 1,	Venture,	Percheron.
666	Ralph Stevenson,	Kennard,	Highland Mac,	Percheron.
535	W. R. Thompson,	Sharon, R. D. No. 58,	Brilliand,	Percheron.
772	Fred Townsend,	Mercer,	Billy Arion,	Standardbred.
141	West Salem Percheron Horse Co.,	Greenville,	Decret,	Percheron.
458	D. F. and H. E. Wick,	Grove City,	Barney,	Clydesdale.
761	C. P. Zimmerman,	Mercer,	Prince Henry,	Clydesdale.

Mifflin County.

267	E. Bruce Alexander,	Belleville,	Nigger,	Shire.
183	J. H. Close,	Milroy,	Flueron de Machelon,	Belgian.
234	S. M. Hazlett,	Allensville,	Lansing H,	Non Standard.
293	Jos. A. Kanagy,	Belleville,	Cornil,	Belgian.
437	A. F. McClintic,	Milroy,	Shadeland Thunderfaus,	Standardbred.
580	O. H. Walters,	Milroy,	Alphonse,	Percheron.
78	M. L. Yoder,	Reedsville,	Brilliant II,	Belgian.

Monroe County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
395	Ervin P. Flick,	Effort,	Senator Krum,	Standardbred.
621	W. C. Hoowd,	Stroudsburg,	Walter Chimes,	Standardbred.

Montgomery County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
275	Wm. L. Austin,	Rosemont,	Cambridge,	Hackney.
832	Geo. Corson,	Plymouth Meeting,	Bounee,	Shetland.
153	John W. W. Crosby,	Conshohocken,	Bellwarden,	Standardbred.
901	Geo. W. Elkins, Jr.,	Abington,	Careonnet,	Percheron.
712	Geo. W. Elkins,	Abington,	Vandala,	Standardbred.
713	Geo. W. Elkins,	Abington,	Norva Onwood,	Standardbred.
714	Geo. W. Elkins,	Abington,	Rundemere,	Standardbred.
719	J. J. Haubert,	Bala,	Bergerae,	Percheron.
923	Wm. N. Hawkins,	Willow Grove,	Roan Lae,	Standardbred.
13	Chas. S. Jenkins,	Lansdale,	Penn Mont Chief,	Shetland.
54	Isaae Norris,	Bryn Mawr,	Nimrod,	Hackney.
451	R. E. Rightnour,	Sanatoga,	Jayward,	Standardbred.
95	J. M. Roshong,	Hatfield,	Chalfont Boy,	Standardbred.
362	W. R. Shuler,	Pottstown,	Spotdale,	Standardbred.
861	I. H. Supplee,	Bryn Mawr,	Happy J,	Standardbred.
14	J. Howard Supplee,	Rosemont,	Gier,	Percheron.
195	E. H. Tyson,	Limerick,	Saladin,	Standardbred.
484	C. Z. Weber,	Norristown,	Bellgregor,	Standardbred.

Montour County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
589	H. C. Munro and S. A. Paul,	White Hall,	Direetron,	Standardbred.

Northampton County.

253	I. G. Coble & Co.,	Bath,	Autumn King,	Standardbred.
348	T. Resh,	Flicksville,	Paul,	Percheron.
286	F. Parker Richards,	Easton,	Baron Sweepstakes,	Standardbred.
313	Seemsville French Draft Horse Co.,	Seigfried,	Bajus,	French Draft.
36	J. J. Shoemaker,	Walnutport,	Arnaux,	Standardbred.
290	Mitchell Walter,	S. Bethlehem,	Barmore,	Standardbred.

Northumberland County.

175	M. S. Adams,	Watsontown,	Brilliant,	Percheron.
7	J. H. Enterline,	Shamokin,	Heart of Oak,	Standardbred.
863	J. W. Moyer,	Sunbury,	John Wayne,	Standardbred.

Perry County.

670	Samuel Black,	Millerstown,	Thymus,	Standardbred.
199	Jos. E. Lesh,	Millerstown,	Teddy,	French Draft.
84	Loysville Percheron Horse Co.,	Loysville,	Orgeval,	Percheron.
837	E. P. McMillen,	Loysville,	Young Sovereign of Oakland,	Clydesdale.
723	Jos. O'Donel,	New Germantown,	Bayard,	Percheron.
346	Shermandale Horse Co.,	Shermandale,	Luxembourg,	Belgian.

Philadelphia County.

192	John Barry,	Chestnut Hill,	Torchlight,	Hackney.
501	Jacob Beiswanger,	Philadelphia,	Flight,	Hackney.
937	Patrick Collins,	Germantown,	Cye Doe,	Standardbred.
308	Peter Cosegrove,	Philadelphia,	Jeannot,	Standardbred.
161	Harry D. Halloway,	Philadelphia,	Brandon,	Hackney.
605	A. E. Leatherman,	Philadelphia,	Adbell, Jr.,	Standardbred.
369	John I. McAnany,	Philadelphia,	The Welchman,	Standardbred.

Philadelphia County—Continued.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
188	C. H. Magill,	Philadelphia,	Imperial Sable,	Standardbred.
87	James Morris,	Philadelphia,	Major Forest,	Standardbred.
946	E. V. Pechin,	Philadelphia,	Bel Tier,	Standardbred.
913	Jas. H. Perry,	Philadelphia,	Agalia Woolnut,	Standardbred.
842	Robert E. Ross,	Philadelphia,	Eaton Tartar King,	Shire.
868	Morris Williams,	Chestnut Hill,	Blacon Chimes,	Clydesdale.
925	Geo. C. Worthington,	Philadelphia,	Robert Beek Owyho,	Standardbred.

Pike County.

(Nothing Registered.)

Potter County.

23	John C. Aylsworth,	Galeton,	Generva B,	Standardbred.
480	Wm. Holt,	Northford,	West Union Boy,	Standardbred.
503	C. C. Reining,	Coudersport,	Brigand,	Percheron.
601	A. R. Symonds,	Elmer,	Loekwood, Jr.,	Standardbred.
462	Wm. L. Woodward,	Millport,	Lusty,	Pereheron.

Schuylkill County.

679	Wm. Bueshley, Jr.,	Pottsville,	Bonnie Boy,	Standardbred.
912	Aaron R. Martz,	Pottsville,	Aaron B,	Standardbred.

Snyder County.

878	Blessing & Sholly,	Pt. Trevorton,	France,	French Draft.
531	German Coach Horse Co.,	Beaver Springs,	Luftikus,	German Coach.
515	C. S. Hall,	Liverpool,	Joli de Jon,	Belgian.
461	G. F. Dimins,	Middleburg,	Carabaldi,	Percheron.
420	John E. Wagner,	McClure,	Valseur,	Percheron.

Somerset County.

100	W. A. Barnhart & Son,	Somerset,	Anibal,	Percheron.
101	W. A. Barnhart & Son,	Somerset,	Floridor,	Percheron.
941	Berlin Percheron Horse Co.,	Berlin,	Rex,	Percheron.
259	Davidsville Percheron Horse Co.,	Davidsville,	Gallant,	Percheron.
6	W. H. Gnagey,	Meyersdale,	Bruce,	Percheron.
47	C. W. Hechler and J. W. Barkley,	Somerset,	Branum,	Belgian.
417	Johnsburg Percheron Horse Co.,	Glencoe,	Matelot,	Percheron.
113	Kingwood Horse Improvement Co.,	Markleton,	Nero,	French Draft.
727	Wm. M. Knecht,	West Salisbury,	Colonel Salisbury,	Standardbred.
728	Wm. M. Knecht,	West Salisbury,	Waskakie,	Thoroughbred.
157	R. W. Lohr,	Boswell,	Nesnil,	Percheron.
755	Wm. Romesburg,	Fort Hill,	Romeo,	Percheron.
648	Geo. Sechler & Son,	Somerset,	Cyclone,	French Draft.
393	Cornelius Shaffer,	Hooversville,	Shadeland Milton,	Percheron.
44	Stoyestown Percheron Horse Co.,	Stoyestown,	Pierrot,	Percheron.
190	Wm. H. Tayman,	Lavansville,	Dadet Bradfield,	Standardbred.
488	Jonas M. and Ed. M. Yoder,	Meyersdale,	Black Mack,	Percheron.
525	M. J. Yoder,	Meyersdale,	Rudolph,	Percheron.

Sullivan County.

866	Otten Bros.,	Lopez,	Precious Jay,	Standardbred.

Susquehanna County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
697	Chas. E. Darrow,	New Milford,	Potentate,	Cleveland Bay.
663	Jas Deubler,	Springville,	Blue Jay Pilot,	Standardbred.
218	T. E. Dolan,	Montrose,	Clinton Audubon,	Standardbred.
709	F. E. Fessenden,	Birchardsville,	Ananas,	Percheron.
586	L. H. Harris,	Lynn,	Kenilworth,	Hackney.
668	Wm. Lott,	Clifford,	General Nogi,	Standardbred.
276	A. H. Moore,	Great Bend,	Cadogan,	Yorkshire.
189	W. I. Morgan,	Uniondale,	Devega,	Standardbred.
73	W. I. Morgan,	Uniondale,	Accolon,	Standardbred.
886	Wm. A. Owens,	Birchardsville,	King Morgan,	Morgan.
143	Geo. W. Travis,	Susquehanna,	M. A. Dewitt,	Standardbred.
24	H. VanBuskirk,	Harford,	Baron Caldwell,	Standardbred.

Tioga County.

642	N. M. Beach,	Mansfield,	Red Morgan,	Morgan.
118	Leon Brown,	Middlebury,	Royal John,	Percheron.
537	L. B. and D. M. Brown,	Elkland,	Daniel,	Percheron.
354	W. B. Eberenz,	Wellsboro,	Atreus,	German Coach.
623	L. P. Erway,	Knoxville,	Tongleur,	Percheron.
380	S. A. Griffin,	Sabinsville,	Vidaldia,	Percheron.
125	J. A. Guiler,	Wellsboro,	Boatlight,	Standardbred.
72	Imported German Coach Horse Co.,	Liberty,	Donner,	German Coach.
843	R. P. and G. C. Kiff,	Mansfield,	Guilbert,	Percheron.
737	F. A. Kloek,	Wellsboro,	Colonel,	Belgian.
198	Sabinsville Percheron Horse Co.,	Sabinsville,	La Ferte,	Percheron.
716	Geo. W. Sheffer,	Blossburg,	Daniel R,	Standardbred.
524	Frank Strang,	Westfield,	King Maceo,	Standardbred.
319	Jos. Vickers,	Mansfield,	Gibson,	Percheron.
694	R. A. Wakely,	Knoxville,	Universal,	French Coach.

Union County.

651	Mifflinburg Horse Co.,	Mifflinburg,	Ture,	Belgian.
460	Selinsgrove Percheron Horse Breeding Ass'n,	Winfield,	Caserio,	Percheron.
294	C. K. Sober,	Lewisburg,	Clay Bells,	Standardbred.
555	White Deer Valley Horse Co.,	Allenwood,	Poupon,	Percheron.
582	J. W. Zeller,	Lewisburg,	West Branch,	Standardbred.

Venango County.

757	H. C. Bruner and W. S. Pierce,	Franklin,	Royal Elect,	Standardbred.
145	H. K. Coast,	Clintonville,	Hilarion,	Belgian.
559	Thos. W. and C. D. Lindsay,	Utica,	Bush's Monarque,	Belgian.
388	John Lytle,	Emlenton,	Chardon,	Percheron.
665	J. B. Nesbit,	Franklin,	Volney,	Percheron.
394	M. F. Mont,	Franklin,	Major Sultan,	Standardbred.
858	C. E. Trace and C. W. Gearing,	Franklin,	King Potent,	Standardbred.

Warren County.

591	A. W. Denninson,	Akeley,	King Edward,	Percheron.
142	J. A. Johnson,	Russell,	Tarquin,	Percheron.
170	Jas. H. Morrison,	Seneca,	Prince,	Percheron.
76	A. D. Root & Co.,	Bear Lake,	Lucifer,	Clydesdale.
770	Geo. Sampson,	Scandia,	Teddy,	Percheron.

Washington County.

926	Ames & Morton,	Bentleyville,	Jackson,	Shire.
256	M. H. Barnford,	Donora,	Star Orato,	Standardbred.
738	W. H. Bedillin,	Washington,	Alliwon,	Standardbred.
530	J. J. Beerens,	Charleroi,	Noel de Neue Cour,	Belgian.
82	Albert Black,	West Brownsville,	Tip Top,	Percheron.
74	A. F. Blayaney,	West Alexander,	Pilon de Foutney,	Belgian.
509	J. G. and H. A. Boyle,	Canonsburg,	Honest John,	Percheron.
468	O. T. Brashear,	Hanlin Station,	Columbus III,	French Draft.

Washington County—Continued.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
76	Jas. S. Buchanan,	Hickory,	Palanquin,	Percheron.
486	Alex. C. Bungard,	Washington,	Coriol,	Belgian.
585	Cannonsburg Percheron Horse Co.,	Canonsburg,	Bataclan,	Percheron.
800	W. H. Davis,	Washington,	Moquette,	Standardbred.
799	W. H. Davis,	Washington,	Littleton Onward,	Standardbred.
377	D. L. Frazee,	Washington,	Dwight,	Percheron.
378	D. L. Frazee,	Washington,	Mouton de Felney,	Belgian.
379	D. L. Frazee,	Washington,	Tip Top Perfection,	Belgian.
215	C. F. Gardner,	Burgettstown,	The Dandy C,	Non Standardbred.
777	J. D. Gibson,	Monongahela,	Paulo,	French Draft.
661	R. C. Grimes,	Claysville,	Volnay,	French Coach.
841	W. S. Grimes,	West Brownsville,	Stephan,	German Coach.
815	W. S. Grimes,	West Brownsville,	Pilon,	Belgian.
619	Hickman Bros.,	Cannonsburg,	Scottish Prince,	Clydesdale.
386	B. C. McCarroll,	Claysville,	Richmond,	Percheron.
257	Lynn McKay,	Washington,	Knox Allerton,	Standardbred.
138	Jos. M. Miller,	Burgettstown,	Captain Borland,	Clydesdale.
593	J. Wildon Moninger,	Washington,	Masterpiece,	Percheron.
855	J. Ray Moore,	Millsboro,	Ogawa,	Standardbred.
396	Manfred Morris,	Claysville,	Libertin, Jr.,	French Draft.
156	Jas. F. Nichols,	Murdocksville,	Prosper,	Percheron.
640	J. E. Perrin,	Independence,	Bucephale,	Percheron.
807	Lindley Post,	West Alexander,	Billy Smith,	Percheron.
167	W. F. Richmond,	Dinsmore,	Gold Mine,	French Draft.
803	Henry M. Riggle,	Washington,	Percy,	Shire.
804	Henry M. Riggle,	Washington,	Royal Reuben,	Shire.
805	Henry M. Riggle,	Washington,	King Salisbury,	Shire.
790	Jas. E. Sampson,	Monongahela,	Eldorado,	Percheron.
421	C. W. Shipe,	Washington,	Financier,	Percheron.
75	E. W. Sprowls,	West Finley,	Rameur II,	Percheron.
678	Isaac A. Stephens,	Claysville,	Bonar,	Percheron.
677	T. J. Stephens,	Claysville,	Hollis,	Percheron.
695	Wm. Taylor Stewart,	Washington,	Edison, Jr.,	Percheron.
196	J. L. Summey,	Finleyville,	Leory,	Percheron.
720	Elmer F. White,	West Alexander,	Gradin,	Percheron.

Wayne County.

11	Wm. Erk,	Starrucca,	Baron Sturdy,	Standardbred.
834	E. V. Moran,	Aldenville,	Ripon's Pride,	Percheron.
329	Reining & Sons,	Cherry Ridge,	Coon,	Percheron.
373	R. P. Schmitt,	White Mills,	Halbgott,	German Coach.
573	Virgil Young,	Lookout,	Dandy, Jr.,	Percheron.

Westmoreland County.

398	W. H. Baldridge,	Latrobe,	Pilot Bells,	Standardbred.
399	W. H. Baldridge,	Latrobe,	Margotin,	Belgian.
400	W. H. Baldridge,	Latrobe,	Neol Gaines,	Saddle.
401	W. H. Baldridge,	Latrobe,	Hebren,	Percheron.
402	W. H. Baldridge,	Latrobe,	Houzon,	Percheron.
206	Thos. Brown and R. C. Campbell,	Madison,	Jacques,	French Draft.
207	Thos. Brown and R. C. Campbell,	Madison,	Sir Alcium,	Standardbred.
208	Thos. Brown and R. C. Campbell,	Madison,	Alto,	Percheron.
746	Bruner & Keiser,	Stahlstown,	Vledoco XX,	Percheron.
303	G. H. Bruner,	West Newton,	Farceur,	Belgian.
351	H. C. Burket and Alex Coulter,	Greensburg,	Duquesne Ideal,	Standardbred.
185	W. S. Coffman,	West Alexander,	Pluto III,	Shire.
290	Jos. Crouse,	Mt. Pleasant,	Gaylord,	Percheron.
445	Amos Cunkleman,	Tunnelton,	Sargeant,	Clydesdale.
367	A. W. Darragh,	Venetia,	Silver Hal,	Standardbred.
368	A. W. Darragh,	Venetia,	Calno,	Belgian.
631	Geo. W. Deeds,	Ligonier,	Identique,	Percheron.
708	S. T. Ford,	New Florence,	Bouche Trov,	French Coach.
556	Jerry Gongaware,	Irwin,	Sheriff,	Clydesdale.
280	Wm. Hudson,	Latrobe,	Carl,	Shire.
281	Wm. Hudson,	Latrobe,	Welcome Gentlemen,	Shire.
562	E. O. Huffman,	Latrobe,	Mount Ego,	Standardbred.
561	E. O. Huffman,	Latrobe,	Essex Oak,	Shire.
644	Irwin Horse Improvement Co.,	Irwin,	Saxon,	Percheron.
271	J. W Keenan,	Export,	Boquet d'erbiss,	Belgian.
947	J. B. Keener,	Greensburg,	Gerson,	Percheron.
159	Samuel Keller,	Stahlstown,	Brinton,	Shire.
121	M. J. Kelley,	Scottdale,	Brightward,	Standardbred.
798	A. P. Larimer,	Van Meter,	Marron,	Belgian.
19[illegible]	Geo. S. Louches,	Alverton,	Fritz,	Percheron.
405	S. W. Lynn,	Smithton,	Torpilleur,	Percheron.
81	J. F. McKenn,	New Kensington,	Royal Clay, Jr.,	Standardbred.
291	J. L. McKeever,	Irwin,	Neron,	Percheron.
523	O. H. McKown,	Apollo,	Morning Star,	Percheron.
917	Ed. L. Rose,	Mt. Pleasant,	Pride of Erin,	Clydesdale.

Westmoreland County—Continued.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
563	Ruff & Leighty,	Tarrs,	Glorieus,	Percheron.
564	Ruff & Leighty,	Tarrs,	Ulhan,	French Coach.
105	Ruff & Leighty,	Tarrs,	Eveille,	Percheron.
106	Ruff & Leighty,	Tarrs,	Horace,	Percheron.
300	C. J. Ruhright,	Murrayville,	Cambon,	Percheron.
12	J. W. Ruth,	Scottdale,	Ohio,	German Coach.
397	Roy E. Sibel,	Ligonier,	Richbell,	Standardbred.
862	C. E. Snyder,	Greensburg,	Judge Steel,	Standardbred.
139	Wm. H. Sowash,	Claridge,	Rosco,	Standardbred.
31	H. F. Stark,	Greensburg,	Hautbois,	Percheron.
539	Albert Steel,	Greensburg,	Goodwood,	Shire.
540	Albert Steel,	Greensburg,	Hapton King,	Shire.
541	Albert Steel,	Greensburg,	Sorrel Top,	Shire.
542	Albert Steel,	Greensburg,	Fleet Hall Ambiton,	Shire.
154	James Steele,	Crabtree,	Desford Viscount,	Shire.
780	Jos. W. Steele,	Greensburg,	Major,	French Draft.
128	Wm. Steel,	Greensburg,	Baron Laird,	Clydesdale.
546	J. R. Truxal,	Greensburg,	Sir Robert Bell,	Clydesdale.
571	G. S. Wainwright,	Livermore,	Ugolien,	Percheron.
572	G. S. Wainwright,	Livermore,	Paris II,	Percheron.
262	R. M. Waldron,	Greensburg,	Hudson's Nigger,	Shire.
263	R. M. Waldron,	Greensburg,	Baritone,	Standardbred.
264	R. M. Waldron,	Greensburg,	Jim Benyon,	Standardbred.
454	B. E. Williams,	West Newton,	Ingomar,	Percheron.
455	B. E. Williams,	West Newton,	Gambetta,	Percheron.
860	H. M. Wolfe,	Ruffsdale,	Red Emmett,	Standardbred.

Wyoming County.

License Number.	Name of Owner.	Address.	Name of Stallion.	Breed.
248	J. C. Bowman,	Meshoppen,	Tartar Prince,	Percheron.
22	J. C. Menges & Son,	Falls, R. D. No. 1,	Wilberforce,	Hackney.
760	B. L. Oakley,	Nicholson,	Bernard Lee,	Standardbred.
372	A. D. Sherwood,	Nicholson,	Pearlamore,	Standardbred.
120	L. L. Stark,	Factoryville,	Don Actuary,	Standardbred.

York County.

122	Leander Blouse,	Felton,	Dupignac,	Standardbred.
653	Dillsburg Percheron Horse Co.,	Dillsburg,	Lybrand,	Percheron.
370	E. M. Free,	Stewartstown,	Lord Silverton,	Standardbred.
371	E. M. Free,	Stewartstown,	Don McKerron,	Standardbred.
202	German Coach Horse Co.,	Manchester,	Missionar,	German Coach.
219	Glen Rock and Seven Valley Horse Breeding Association.	Seven Valley,	Hoir,	Percheron.
246	Leonard H. Greenewalt,	Hanover,	Merrill Hawker,	Standardbred.
628	E. C. Henry,	Codorus,	Dr. Hig,	Standardbred.
699	Imported Horse Co.,	Fawn Grove,	Voltaire,	Percheron.
782	John H. March,	Rossville,	Martell,	Percheron.
217	A. C. Martin,	Muddy Creek Forks,	Coldemar,	Morgan.
936	Geo. D. Miller,	Lewisberry,	Anton,	German Coach.
339	D. C. Reel,	Fawn Grove,	Memphis,	German Coach.
46	J. M. Stritehoff,	Fawn Grove,	Funk,	German Coach.

OUT OF STATE.

903	Theo. W. Barker,	Mon, W. Va.,	Hydrogen,	Standardbred.
10	W. H. Boyd,	Toronto, O.,	Craquerer,	Percheron.
758	Calvin Cordray,	Cassville, W. Va.,	Huchan,	Percheron.
111	Cross & Allen,	Niobe, N. Y.,	Radiguil,	Percheron.
652	Samuel Emmeret,	Hagerstown, Md.,	LeRoy V,	Percheron.
52	Geo. H. Estabrook,	Denver,	Colorado E,	Standardbred.
657	French Draft Horse Co.,	Ellershie, R. D., Md.,	Uron II,	French Draft.
839	Greenwood Stock Co.,	Greenwood, N. Y.,	French Monarch,	Percheron.
779	Geo. E. Hughes,	Hancock, Md.,	Invincible,	French Coach.
853	W. E. Jackson,	Frewsburg, N. Y.,	Guy Pilot,	Standardbred.
795	R. W. Jerisatti,	Atlantic City, N. J.,	Jameel,	Arabian.
783	E. S. Lemely,	Benton, W. Va.,	Harry Allen,	Morgan.
776	M. E. Martin,	Pentress, W. Va.,	Blarney Boy,	Standardbred.
739	E. B. Moose,	Woodruff, W. Va.,	Fordy Lad,	Shire.
919	John Newborough,	Morgantown, W. Va.,	Ben Bolt,	Belgian.
908	Olean Hackney Horse Breeders' Association,	Olean, N. Y.,	St. Dennis,	Hackney.
749	E. M. Portsman,	Morgantown, W. Va.,	Jupiter,	Percheron.
849	John H. Slocum,	Ceres, N. Y.,	Port Ora,	Shire.
748	Spiekler & Stauffer,	Hagerstown, Md.,	Rene,	Percheron.
226	R. W. Sternberg,	Frewsburg, N. Y.,	Montgomery Ward,	Percheron.
117	G. H. Straight,	Pierpont, O.,	Rex,	Percheron.
685	L. O. Swan,	Jasper, N. Y.,	Captiola,	Percheron.
686	L. O. Swan,	Jasper, N. Y.,	Teddy,	Percheron.
166	Whiteville Percheron Horse Co.,	Whitesville, N. Y.,	Chapon,	Percheron.

Commonwealth of Pennsylvania.

DEPARTMENT OF AGRICULTURE.

DAIRY AND FOOD DIVISION.

LAW BULLETIN.

Containing the Law Creating a Department of Agriculture in Pennsylvania, the various Acts of Assembly Committed to the Dairy and Food Division for Enforcement, a Brief Digest of Numerous Decisions of Courts Relating to the Aforesaid Laws, and Rules and Regulations.

N. B. CRITCHFIELD, *Secretary of Agriculture,*
JAMES FOUST, *Dairy and Food Commissioner.*

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PREFACE.

The following compilation of the statutes relating to the creation of the office of Dairy and Food Commissioner and his duties, etc., under such statutes, are published to meet the demand coming from persons who desire the information they contain.

The call for such information is great, and as this publication contains the Acts of Assembly, the enforcement of which is placed in the hands of the Dairy and Food Commissioner, it is of special importance.

There is no more effectual method for securing obedience to law than that of giving notice to the public of its requirements; and any person wishing to be informed, whether he be manufacturer, dealer or consumer, can secure proper information upon this subject by applying to the Dairy and Food Commissioner for this Bulletin.

A brief summary of various court decisions relating to these statutes is appended, and will be found convenient for reference by attorneys and others interested.

N. B. Critchfield

Secretary of Agriculture.

DEPARTMENT OF AGRICULTURE.

DAIRY AND FOOD DIVISION.

Harrisburg, Pennsylvania, August 1st, 1912.

To Whom it may Concern:

The accompanying digest of Acts of Assembly relating to the organization of the Department of Agriculture, and the Dairy and Food Division in particular, is respectfully presented for the information of all interested in the manufacture, sale or use of dairy and food products.

The several preceding large editions of bulletins of a similar character are entirely exhausted, and the present edition has therefore been prepared and printed to meet the constantly increasing demand from manufacturers, dealers and others for information concerning such legislation as is included within the limited space of this publication.

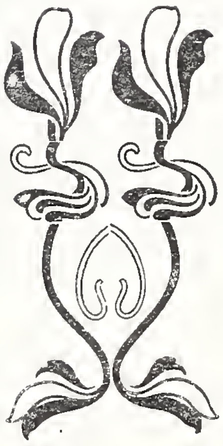
Special attention is directed to the important dairy and food laws enacted by the Legislatures of 1909 and 1911, which are printed within the pages of this Bulletin. The rules and regulations relating to the Pure Food Act of May 13th, 1909, will also prove of interest and value to those concerned.

The continued favorable co-operation of the press, trade and the public in general, in enforcing the aforesaid laws, is respectfully requested, believing that the cause is a most worthy one, protecting human life, as well as preventing gross fraud and deception in the sale of dairy and food products.

Very respectfully yours.

James Foust

Dairy and Food Commissioner.



ACT CREATING A DEPARTMENT OF AGRICULTURE.

AN ACT

To establish a Department of Agriculture and to define its duties and to provide for its proper administration.

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same, That there be and hereby is established a Department of Agriculture, to be organized and administered by an officer who shall be known as the Secretary of Agriculture, who shall be appointed by the Governor, by and with the advice and consent of the Senate, for a term of four years at an annual salary of three thousand five hundred dollars; and, who before entering upon the duties of his office shall take and subscribe the oath prescribed in Article seven of the Constitution. Said secretary shall be ex-officio secretary of the State Board of Agriculture, and shall succeed to all the powers and duties now conferred by law upon the secretary of said Board.

Section 2. That it shall be the duty of the Secretary of Agriculture, in such ways as he may deem fit and proper, to encourage and promote the development of agriculture, horticulture, forestry and kindred industries; to collect and publish statistics and other information in regard to the agricultural industries and interests of the State; to investigate the adaptability of grains, fruits, grasses and other crops to the soil and climate of the State, together with the diseases to which they are severally liable and the remedies therefor; to obtain and distribute information on all matters relating to the raising and care of stock and poultry, the best methods of producing wool and preparing the same for market, and shall diligently prosecute all such similar inquiries as may be required by the agricultural interests of the State, and as will best promote the ends for which the Department of Agriculture is established. He shall give special attention to such questions relating to the valuation and taxation of farm land, to the variation and diversification in the kinds of crops and methods of cultivation and their adaptability to changing markets as may rise from time to time in consequence of a change of methods, means and rates of transportation, or in the habits or occupation of the people of the State and elsewhere, and shall publish, as frequently as practicable, such information thereon as he shall deem useful. In the performance of the duties prescribed by this act. the Secretary of Agriculture shall, as far as practicable, make use of the facilities provided by the State Agricultural Experiment Station, the State Board of Agriculture and the various State and county societies and organizations maintained by agriculturists and horticulturists, whether with or without the aid of the State, and shall, as far as practicable, enlist the aid of the State Geological Survey for the purpose of obtaining and publishing useful information respecting the economic relations of geology to agriculture, forestry and kindred industries. He shall make an annual report to the Governor, and shall publish, from time to time, such bulletins of information as he may deem useful and advisable. Said report and bulletins shall be printed by the State Printer in the same manner as other public documents, not exceeding five thousand copies of any one bulletin.

Section 3. That it shall be the duty of the Secretary to obtain and publish information respecting the extent and condition of forest lands in this State; to make and carry out rules and regulations for the enforcement of all laws designed to protect forests from fire and from all illegal depredations and destructions, and report the same annually to the Governor; and, as far as practicable, to give information and advice respecting the best methods of preserving wood lands and starting new plantations. He shall also, as far as practicable, procure statistics of the amount of timber cut during each year, the purposes for which it is used, and the amount of timber land thus cleared as compared with the amount of land newly brought under timber cultivation, and shall in general, adopt all such measures as in his judgment may be desirable and effective for the preservation and increase of the timber lands of this State, and shall have direct charge and control of the management of all forest lands belonging to the Commonwealth, subject to the provisions of law relative thereto. The said Secretary shall also be and hereby is charged with the administration of all laws designed to prevent fraud or adulteration in the preparation, manufacture or sale of articles of food, the inspection, sale or transportation of the agricultural products, or imitations thereof, and all laws relating to diseases of domestic animals, and to the manufacture and inspection of commercial fertilizers.

Section 4. There shall be one Deputy Secretary, who shall be appointed by the Governor for the term of four years, at a salary of three thousand dollars a year, who shall also be a Director of Farmers' Institutes. The other officers of the Department shall be appointed by the Governor for the term of four years, and shall be an Economic Zoologist, a Commisioner of Forestry,* a Dairy and Food Commisioner who shall have practical experience in the manufacture of dairy products, and State Veterinarian who shall be a graduate of some reputable veterinary college, who shall receive an annual salary of twenty-five hundred dollars each. The Dairy and Food Commissioner shall, under the direction of the Secretary, perform the duties prescribed by an act approved May twenty-sixth, one thousand eight hundred and ninety-three. The Governor is hereby authorized to appoint one chief clerk of the Department at an annual salary of sixteen hundred dollars, one stenographer at a salary of eight hundred dollars a year, and one messenger at a salary of six hundred dollars a year; and the Dairy and Food Commissioner, the Commissioner of Forestry and the Economic Zoologist shall each have a clerk, who shall be appointed by the Governor, and who shall serve under the direction of the respective commissioners aforesaid, and receive a salary of fifteen hundred dollars a year each.

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*The office of Commissioner of Forestry was taken out of the Department of Agriculture by the Act of 1901, establishing a Department of Forestry.

Section 5. That it shall be the duty of the Superintendent of Institutes to arrange them in such manner as to time and places of holding the same as to secure the greatest economy and efficiency of service, and to this end he shall, in each county where such institutes are to be held, confer and advise with the local member of the State Board of Agriculture, together with representatives duly appointed by each county agricultural, horticultural and other like organizations with reference to the appointment of speakers and other local arrangements.

Section 6. That the Secretary may, at his discretion, employ experts for special examinations or investigations, the expenses of which shall be paid by the State Treasurer in the same manner as like expenses are provided by law, but not more than five thousand dollars shall be so expended in any one year. In his annual report to the Governor, he may include so much of the reports of other organizations as he shall deem proper, which shall take the place of the present agricultural reports, and of which thirty-one thousand six hundred copies shall be published and distributed as follows:

To the Senate, nine thousand copies; to the House of Representatives, twenty thousand copies; to the Secretary of Agriculture, two thousand copies; to the State Librarian, for distribution among public libraries and for reserve work, five hundred copies, and to the State Agricultural Experiment Station, one hundred copies.

Section 7. That the Secretary of Agriculture shall have an office at the State Capitol, and it is hereby made the duty of the Commissioner of Public Buildings and Grounds to provide the necessary rooms, furniture and apparatus for the use of the Department.

Section 8. That all acts or parts of the acts inconsistent herewith be and the same are hereby repealed.

Approved— March 13, 1895.

ACT PROVIDING FOR DAIRY AND FOOD COMMISSIONER.

AN ACT

To enlarge the powers of the State Board of Agriculture, to authorize the said Board to enforce the provisions of the act, entitled "An act for the protection of the public health, and to prevent adulteration of dairy products and fraud in the sale thereof," approved May twenty-one, Anno Domini one thousand eight hundred and eighty-five, and of other acts in relation to dairy products; to authorize the appointment of an agent of the said Board who shall be known as the "Dairy and Food Commissioner," and to define his duties and fix his compensation, being supplementary to an act, entitled "An act to establish a State Board of Agriculture," approved May eighth, Anno Domini one thousand eight hundred and seventy-six.

Section 1. Be it enacted, &c., That the State Board of Agriculture be and is hereby empowered and charged with the enforcement of the provisions of the act, entitled "An act for the protection of the public health, and to prevent the adulteration of dairy products and fraud in the sale thereof," approved May twenty-one, Anno Domini, one thousand eight hundred and eighty-five, and with the enforcement of the various provisions of all other laws now enacted, or hereafter to be enacted, prohibiting or regulating the adulteration or imitation of butter, cheese or other dairy products.

Section 2. That for the purpose of securing the enforcement of the provisions of the said laws concerning dairy products, the president of the said State Board of Agriculture be and hereby is authorized and empowered to appoint an agent of the said Board, who shall be known by the name and title of the "Dairy and Food Commissioner," who shall hold his office for the term of two years, or until his successor shall be duly appointed and qualified, and shall receive a salary of two thousand dollars per annum and his necessary expenses incurred in the discharge of his official duties under this act. The said agent shall be charged under the direction of the said Board with the execution and enforcement of all laws now enacted, or hereafter to be enacted, in relation to the adulteration or imitation of dairy products.

Section 3. That the said agent of the said Board, the said Dairy and Food Commissioner, is hereby authorized and empowered, subject to the approval of the said State Board of Agriculture, to appoint and fix the compensation of such assistants, agents, experts, chemists, detectives and counsel, as may be deemed by him necessary for the proper discharge of the duties of his office, and for the discovery and prosecution of violations of the said laws: Provided, That the entire expenses of the said agent and of all his assistants, agents, experts, chemists, detectives and counsel (salaries included), shall not exceed the sum appropriated for the purposes of this act.

Section 4. That the said agent of the State Board of Agriculture and such assistants, agents, experts, chemists, detectives and counsel, as he shall duly authorize for the purpose, shall have full access, egress and ingress, to all places of business, factories, farms, buildings, carriages, cars, vessels and cans, used in the manufacture, transportation and sale of any dairy products, or of any adulteration or imitation thereof. They shall also have power and authority to open any package, can or vessel, containing dairy products, or any adulteration or imitation thereof, which may be manufactured, sold or exposed for sale, in violation of any of the provisions of any act now enacted or which may be hereafter enacted in relation to dairy products, or the adulteration or imitation thereof, and they shall also have power to take from such package, can or vessel, samples for analysis.

Section 5. That all penalties and costs received by the said State Board of Agriculture for violations of the said act of May twenty-one, Anno Domini one thousand eight hundred and eighty-five, and of other acts now enacted or hereafter to be enacted, prohibiting or regulating the adulteration or imitation of butter, cheese or other dairy products, shall be appropriated by the said Board to the payment only of the necessary expenses incurred by the said Dairy and Food Commissioner and his assistants and agents in the investigation, discovery and prosecution of violations of the said act.

Section 6. That all charges, accounts and expenses of the said Commissioner, and of all the assistants, agents, experts, chemists, detectives and counsel employed by him, shall be paid by the Treasurer of the State in the same manner as other accounts and expenses of the said State Board of Agriculture are now paid as provided by law.

Section 7. That the said Commissioner shall make annual reports of his work and proceedings, and shall report in detail the number and names of the assistants, agents, experts, chemists, detectives and counsel employed by him, with their expenses and disbursements, the number of prosecutions, the number of convictions and the penalties recovered in each case, which report shall be presented to the said State Board of Agriculture at its annual meeting.

Approved—The 26th day of May, A. D. 1893.

PURE FOOD ACT, 1909.

AN ACT

Relating to food: defining food; providing for the protection of the public health, and the prevention of fraud and deception, by prohibiting the manufacture or sale, the offering for sale or exposing for sale, or the having in possession with intent to sell, of adulterated, misbranded, or deleterious foods; prescribing certain duties of the Dairy and Food Commissioner in reference thereto; and providing penalties for the violation thereof.

Section 1. Be it enacted, &c., That it shall be unlawful for any person, firm, copartnership, limited partnership, joint-stock company, or corporate body, by himself, herself, itself, or themselves, or by his, her, its, or their agents, servants, or employes, to manufacture, sell, offer for sale, expose for sale, or have in possession with intent to sell, any article of food which is adulterated or misbranded within the meaning of this act.

Section 2. That the term "Food," as used in this act, shall include not only every article used for food by man, but also every article used for, or entering into the composition of, or intended for use as an ingredient in the preparation of, food for man.

That the term "Person," as used in this act, shall include individuals, firms, copartnerships, limited partnerships, joint-stock companies, and bodies corporate, as well as all officers, agents, servants, employes, or others acting for any of the same, and shall be taken as applying in the singular or plural as the case may require.

Section 3. That for the purpose of this act, an article of food shall be deemed to be adulterated,—

First. If any substance has been mixed or packed with it, so as to reduce or lower or injuriously affect its quality, strength, or purity.

Second. If any substance has been substituted, wholly or in part, for the article.

Third. If any valuable constituent of the article has been, wholly or in part, abstracted.

Fourth. If it be mixed, colored or changed in color, coated, polished, powdered, stained, or bleached, whereby damage or inferiority is concealed, or so as to deceive or mislead the purchaser; or if by any means, it is made to appear better or of greater value than it is.

Fifth. If it contains any added sulphurous acid, sulphur dioxide, or sulphites, benzoate acid or benzoates, except as hereafter provided; or if it contains any added boric acid or borates, salicylic acid or salicylates, formaldehyde, hydrofluoric acid or fluorides, fluoborates, fluosilicates, or other fluorine compounds, dulcin, glucin, saccharin, alum, compounds of copper, bethanapthol, hydronapthol, abrastol, asaprol, oxides of nitrogen, nitrous acid or nitrates, pyroligneous acid, or other added ingredients deleterious to health; or if, in the case of confectionery, it contains any of the substances mentioned in this paragraph, or any mineral substance, or injurious color or flavor, alcoholic liquor, or any other ingredients, not herein mentioned, deleterious to health: Providing, That this act shall not be construed to prohibit the use of harmless colors of any kind, in confectionery, when used for coloring, and not for any fraudulent purpose: And provided further, That nothing in this act shall be construed to prohibit the use of common salt, sugar, pure corn syrup, pure glucose, wine vinegar, cider vinegar, malt vinegar, sugar vinegar, glucose vinegar, distilled vinegar, spices or their essential oils, alcohol (except in confectionery), edible oils, edible fats, wood smoke applied directly as generated, or proper refrigeration. And provided further, That in the manufacture of confectionery the use of alcohol shall be permitted as it may be found in customary alcoholic tinctures or extracts used for flavoring purposes only, and as a solvent for glazes, and that oil of sweet birch, or methyl-salicylic ester, may be used as a substitute for oil of wintergreen as a flavor: And provided further, That in the preparation of dried fruits and molasses, sulphur dioxide, either free or in simple combination, may be used in such quantities as will not render said dried fruits or molasses deleterious to health; and that sodium benzoate may be used in the preparation of those articles of food in which it has heretofore been generally used, in quantities not exceeding one-tenth (1-10) of one per centum, or benzoic acid, equivalent thereto: And provided further, That when any quanity of sodium benzoate is used in any article of food, or any quantity of sulphur dioxide is used in the preparation of dried fruits or molasses, the fact that sodium benzoate or sulphur dioxide has been used in the preparation thereof shall be plainly stated on each package of such food.

Sixth. If it consists of, or is manufactured in whole or in part from, a diseased, contaminated, filthy, or decomposed substance, either animal or vegetable; or an animal or vegetable substance produced, stored, transported, or kept in a way or manner that would render the article diseased, contaminated, or unwholesome; or if it is any part of the product of a diseased animal, or the product of an animal that has died otherwise than by slaughter.

Section 4. That for the purpose of this act, an article shall be deemed to misbranded,—

First. If it be an imitation of, or offered for sale under, the name of another article.

Second. If it be labeled or branded so that it may deceive or mislead the purchaser; or purport to be foreign product, when not so; or if the contents of the package as originally put up shall have been removed, in whole or in part, and other inferior contents shall have been placed in such package.

Third. If the package containing it, or its label, shall bear any statement, design, or device, regarding the substances or ingredients contained therein, which statement, design, or device shall be false or misleading in any particular.

Fourth. If it be a mixture or compound which may be known, or from time to time hereafter known, as an article of food, unless it be accompanied on the label or brand with a statement that it is a mixture or compound and a statement of the substance entering into said mixture or compound. All labeling of packages required by this act shall be on the main label of each package, and in type not less than eight point, brevier caps, in size,—unless the size of the package will not permit the use of eight-point cap type, in which case the size of the type may be reduced proportionately,—and in such position and terms as may be plainly seen and read by the purchaser: Provided, That nothing in this act shall be construed as requiring or compelling the proprietors, manufacturers, or sellers of proprietary foods to disclose their trade formulas, except in so far as may be necessary under the provisions of this act to avoid adulteration, imitation, or misbranding.

Section 5. When the Dairy and Food Commissioner, or his agent shall obtain an article of food, or a sample or portion thereof, from any person, for the purpose of determining whether the same is adulterated or misbranded within the meaning of this act, and it shall be found that the said article of food is adulterated or misbranded within the meaning of this act, when the Dairy and Food Commissioner shall proceed against the said person, from whose store, warehouse, or other place of business said article, sample, or portion thereof, shall have been obtained, for a violation of the provisions of this act.

But no prosecution shall be sustained, under the provisions of this act, against a retail dealer for the selling, offering for sale, exposing for sale, or having in possession with intent to sell, of any adulterated or misbranded article of food, as defined herein, if the retail dealer from whom the said article of food, sample, or portion thereof, was obtained by the Dairy and Food Commissioner or his agent, can establish a guaranty, signed by the manufacturer or wholesale dealer, or jobber or distributor, residing in the United States, from whom such article of food was purchased or procured, to the effect that the same is not adulterated or misbranded within the meaning of this act, designating it.

Said guaranty to afford protection shall contain the name and address of the manufacturer or wholesale dealer, or jobber or distributor, making the sale of such articles of food to such retailer, and in such case the said manufacturer or wholesale dealer, or jobber or distributor, so as aforesaid giving such guaranty, shall be amenable to the prosecution, fines and other penalties which would attach, in due course, to the retailer holding such guaranty under the provisions of this act, for a violation hereof; and every manufacturer or wholesale dealer, or jobber or distributor, giving a guaranty under the provisions of this act shall be held responsible, and shall be proceeded against for the adulteration or misbranding of any article of food sold under said guaranty, and shall be subject to the penalties for the violation of the provisions of this act. No such guaranty shall operate as a defense to prosecution for a violation of the provisions of this act, if the retailer holding such guaranty shall continue to sell the same article of food after written or printed notice.from the Dairy and Food Commissioner, or his agent, that such article is adulterated or misbranded within the meaning of this act.

But if said person shall violate the provisions of paragraph six section three of this act, by having stored or transported or kept said article, in said paragraph mentioned, in a way or manner to render it diseased, contaminated, or unwholesome, said person shall be proceeded against for a violation of the provisions of this act: and it shall not be necessary for conviction that any article, sample, or portion thereof, shall be obtained by the Dairy and Food Commissioner, or his agent, as a condition precedent to prosecution.

Section 6. For the purpose of this act, an article shall be deemed to be the same article,—

First. When it shall be of the same brand, or have thereon the same label, and shall be adulterated or misbranded in the same way.

Second. When it is not labeled or branded, but is sold, offered for sale, or exposed for sale under the same name, and adulterated or misbranded in the same way.

Third. When, although sold, offered for sale, or exposed for sale under another name, or labeled or branded in a different way, it shall be found to be the product of the same manufacturer, grower, or maker, and to be adulterated or misbranded in the same way: Provided, however, That an article shall be deemed to be adulterated in the same way if it shall contain the same adulterant substance or substances.

Section 7. Any person who shall violate any of the provisions of this act shall be guilty of a misdemeanor, and upon conviction thereof, shall be sentenced to pay a fine of not less than sixty dollars nor more than one hundred dollars.

Section 8. The Dairy and Food Commissioner of the State shall be charged with enforcement of the provisions of this act and shall make rules and regulations for the proper enforcement thereof, and shall cause such rules and regulations to be published in the official bulletin in the issue immediately following the preparation of the same.

Section 9. All fines and penalties imposed and recovered for the violation of any of the provisions of this act shall be paid to the Dairy and Food Commissioner or his agent, and by the Dairy and Food Commissioner be paid into the State Treasury, for the use of the Commonwealth.

Section 10. The following acts of Assembly: namely,—An act, entitled "An act to provide against the adulteration of food, and providing for the enforcement thereof," approved the twenty-sixth day of June, Anno Domini one thousand eight hundred and ninety-five:

And an act, entitled "An act for the protection of public health, by prohibiting the manufacture and sale, offering for sale, or having in possession with intent to sell, within the State, of adulterated, misbranded, poisonous, or deleterious foods and confections; regulating the enforcement of the provisions hereof; providing for the protection of persons buying and selling adulterated or misbranded foods and confections under a guaranty; and providing penalties for the violation thereof," approved the first day of June, Anno Domini one thousand nine hundred and seven,—be, and the same are hereby repealed.

Provided, nevertheless, That this act shall not apply to, nor in any way affect,—

An act entitled "An act to prohibit the adulteration or coloring of milk and cream by the addition of so-called preservatives or coloring matter, and to provide for the enforcement of the same," approved the tenth day of June, Anno Domini one thousand eight hundred and ninety-seven:

And the amendment thereto, approved the nineteenth day of April, Anno Domini one thousand nine hundred and one, entitled "An act to amend the first section of an act, entitled 'An act to prohibit the adulteration or coloring of milk and cream by the addition of so-called preservatives or coloring matter, and to provide for the enforcement of the same,'" approved the tenth day of June, Anno Domini one thousand eight hundred and ninety-seven;

Nor the act, entitled " An act to prohibit the manufacture and sale of oleomargarine, butterine, and other similar products, when colored in imitation of yellow butter; to provide for license fees to be paid by manufacturers, wholesale and retail dealers, and by proprietors of hotels, restaurants, dining-rooms and boarding-houses, for the manufacture and sale of oleomargarine, butterine, or other similar products, not colored in imitation of yellow butter; and to regulate the manufacture and sale of oleomargarine, butterine, or other similar products, not colored in imitation of yellow butter, and prevent and punish fraud and deception in such manufacture and sale as an imitation butter; and to prescribe penalties and punishment for violations of this act, and the means and the method of procedure for its enforcement, and regulate certain matters of evidence in such procedure," approved the twenty-ninth day of May, Anno Domini one thousand nine hundred and one;

Nor the act, entitled "An act defining boiled or process butter; designating the name by which it shall be known; providing for the licensing of manufacturers and dealers therein, and regulating the sale and labeling of the same so as to prevent fraud and deception in its sale; providing punishment for violations of this act, the methods of procedure for its enforcement, and certain matters of evidence in such procedure," approved the tenth day of July, Anno Domini one thousand nine hundred and one;

Nor the act, entitled "An act to prohibit the selling, shipping, consigning, offering for sale, exposing for sale, or having in possession with intent to sell, as fresh, any meat, poultry, game fish or shellfish which contains any substance or article possessing a preservative or coloring character or action; making the same a misdemeanor, and to prescribe penalties and punishment for violations, and the means and the methods of procedure for the enforcement thereof," approved the twenty-eighth day of March, Anno Domini one thousand nine hundred and five;

Nor the act, entitled "An act providing for the regulation of the manufacture and sale of distilled and fermented vinegars; prescribing their standard to prevent the adulteration of the same, providing for the enforcement thereof, and punishment for the violation of the same," approved the eighteenth day of June, Anno Domini one thousand eight hundred and ninety-seven;

Nor the amendment thereto approved the twenty-first day of May, Anno Domini one thousand nine hundred and one, entitled "An act to amend the first and second sections of an act, entitled 'An act providing for the regulation of the manufacture and sale of distilled and fermented vinegars; prescribing their standard to prevent the adulteration of the same; providing for the enforcement thereof, and the punishment for the violation of the same,' approved the eighteenth day of June, Anno Domini one thousand eight hundred and ninety-seven, so as to provide that vinegar made wholly from grapes, apples, or other fruits shall not be required to contain an acidity of four per centum."

Nor the act, entitled "An act to prevent fraud and deception in the manufacture and sale of cheese, and defining what shall constitute the various grades of cheese; providing rules and regulations for marking and branding the same; providing for the enforcement of this act; prescribing penalties for its violation," approved the twenty-third day of June, Anno Domini one thousand eight hundred and ninety-seven;

And the amendment thereto, approved the second day of May, Anno Domini one thousand nine hundred and one, entitled "An act to amend section two of an act, entitled 'An act to prevent fraud and deception in the manufacture and sale of cheese, and defining what shall constitute the various grades of cheese; providing rules and regulations for marking and branding the same; providing for the enforcement of this act; prescribing penalties for its violation,' approved the twenty-third day of June, Anno Domini one thousand eight hundred and ninety-seven;"

Nor the act, entitled "An act regulating the manufacture or sale of fruit syrups; providing for the enforcement thereof; and to repeal an act, entitled 'An act relative to adulteration of natural fruit juice, and providing penalties for violations thereof,' approved the second day of May, Anno Domini one thousand nine hundred and one," approved the twenty-sixth day of April, Anno Domini one thousand nine hundred and five:—

All of which acts shall remain in full force.

Approved—The 13th day of May, A. D. 1909.

MILK AND CREAM ACT.

AN ACT

Relating to milk: providing for the protection of the public health, and the prevention of fraud and deception, by regulating the sale of milk, skimmed milk and cream; providing penalties for the violation thereof; and providing for the enforcement thereof.

Section 1. Be it enacted, &c., That it shall be unlawful for any person, firm or corporate body, by himself, herself, itself or themselves, or by his, her, its or their agents, servants or employes to sell, offer for sale, expose for sale, or have in possession with intent to sell, milk which contains any added water, or milk which has had the butter-fat or any portion thereof removed therefrom, or milk to which has been added any substance for the purpose of increasing its consistency or thickness, or milk which contains less than three and one-quarter ($3\frac{1}{4}$) per centum of butter-fat and less than twelve (12) per centum of milk solids: Provided, however, That skimmed milk, when clean and wholesome, may be sold, if sold as skimmed milk.

Section 2. That it shall be unlawful for any person, firm or corporate body, by himself, herself, itself or themselves, or by his, her, its or their agents, servants, or employes, to sell, offer for sale, expose for sale, or have in possession with intent to sell, cream which contains or is mixed with any added condensed or evaporated milk or cream, or cream to which has been added any substance for the purpose of increasing its consistency or thickness, or cream which contains less than eighteen (18) per centum of butter-fat: Provided That cream, when it contains or is mixed with any added condensed or evaporated milk or cream, may be sold, if the vessel or container in which such cream is sold is plainly labeled, stating the fact that such cream contains or is mixed with added condensed or evaporated milk or cream, and the amount thereof.

Section 3. That any person who shall violate any of the provisions of this act shall be guilty of a misdemeanor, and upon conviction thereof shall be sentenced to pay a fine of not less than twenty-five (25) dollars, nor more than fifty (50) dollars, or imprisonment for not less than thirty (30) days, nor more than ninety (90) days, or either or both, at the discretion of the court.

Section 4. That the Dairy and Food Commissioner shall be charged with the enforcement of the provisions of this act.

Section 5. That all fines and penalties imposed and recovered for the violation of any of the provisions of this act shall be paid to the Dairy and Food Commissioner, or his agent, and when so collected and paid shall thereafter be, by the Dairy and Food Commissioner, paid into the State Treasury, for the use of the Commonwealth.

Section 6. This act shall not apply to nor in any way affect the act, entitled "An act to prohibit the adulteration or coloring of milk and cream by the addition of so-called preservatives or coloring matter, and to provide for the enforcement of the same," approved the tenth day of June, Anno Domini one thousand eight hundred and ninety-seven, and the amendment thereto, approved the nineteenth day of April, Anno Domini one thousand nine hundred and one entitled "An act to amend the first section of an act, entitled 'An act to prohibit the adulteration or coloring of milk and cream by the addition of so-called preservatives or coloring matter, and to provide for the enforcement of the same,' approved the tenth day of June, Anno Domini one thousand eight hundred and ninety-seven."—which act shall remain in full force; but all other acts or parts of acts inconsistent with the provisions of this act be and the same are hereby repealed.

Approved—The 8th day of June, A. D. 1911.

SAUSAGE ACT.

AN ACT

Providing for the protection of the public health and the prevention of fraud and deception, by prohibiting the sale, the offering for sale or exposing for sale, or the having in possession with intent to sell, of adulterated or deleterious sausage; defining sausage; and prescribing the penalty for the violation thereof.

Section 1. Be it enacted, &c., That it shall be unlawful for any person or persons, by himself, herself or themselves, or by his, her or their agents, servants or employes, to sell, offer for sale, expose for sale, or have in possession with intent to sell, sausage that is adulterated within the meaning of this act.

Section 2. Defining sausage. That, for the purpose of the act, sausage or sausage-meat shall be held to be a comminuted meat from neat cattle or swine, or a mixture of such meats, either fresh, salted, pickled or smoked, with added salt and spices, and with or without the addition of edible animal fats, blood and sugar, or subsequent smoking. It shall contain no larger amount of water than the meats from which it is prepared contain when in their fresh condition.

Section 3. That for the purpose of this act, sausage shall be deemed to be adulterated—

First. If it contains added water in excess of the quantity required to bring the amount up to that which the meats from which it is prepared contain immediately after slaughter.

Second. If it contains any cereal or vegetable flour.

Third. If it contains any coal-tar dye, boric acid or borates, sulphites, sulphur dioxide, sulphurous acid, or any other substance injurious or deleterious to health.

Fourth. If it contains any diseased, contaminated, filthy or decomposed substance; or is manufactured, in whole or in part, from a diseased, contaminated, filthy or decomposed substance, or a substance produced, stored, transported or kept in a way or manner that would render the article diseased, contaminated or unwholesome; or if it is any product of a diseased animal, or the product of any animal which has died otherwise than by slaughter.

Section 4. That any persons who shall violate any of the provisions of this act shall be guilty of a misdemeanor, and upon conviction thereof shall be sentenced to pay a fine of not less than one hundred ($100) dollars, nor more than two hundred ($200) dollars, or to undergo an imprisonment of not less than thirty (30) days, nor more than sixty (60) days, or both or either, at the discretion of the court.

Section 5. That the Dairy and Food Commissioner shall be charged with the enforcement of the provisions of this act.

Section 6. That all fines and penalties imposed and recovered for the violation of any of the provisions of this act shall be paid to the Dairy and Food Commissioner, or his agent, and when so collected and paid shall thereafter be by the Dairy and Food Commissioner paid into the State Treasury, for the use of the Commonwealth.

Approved—The 6th day of April, A. D. 1911.

NON-ALCOHOLIC DRINKS ACT..

AN ACT

Relating to non-alcoholic drinks: defining the same; and prohibiting the manufacture, sale, offering for sale, exposing for sale, or having in possession with intent to sell, of any adulterated or misbranded non-alcoholic drinks; and providing penalties for the violation thereof, and providing for the enforcement thereof.

Section 1. Be it enacted, &c., That it shall be unlawful for any person, firm, or corporate body, by himself, herself, itself or themselves, or by his, her, its or their agents, servants, or employes, to manufacture, sell, offer for sale, expose for sale, or have in possession with intent to sell, any article of non-alcoholic drink which is adulterated or misbranded, within the meaning of this act.

Section 2. That the term "non-alcoholic drink," as used herein, shall include carbonated beverages of all flavors, sarsaparilla, ginger ale, soda water of all flavors, lemonade, orangeade, root beer, grape juice, and all other non-intoxicating drinks.

Section 3. A non-alcoholic drink shall be deemed to be adulterated, within the meaning of this act, if it contains any added boric acid or borates, salicylic acid or salicylates, formaldehyde, sulphurous acid or sulphites, hydrofluoric acid or fluorides, fluoborates, fluosilicates, or other fluorine compounds, dulcin, glucin, saccharin, betanapthol, hydronapthol, abrastol, asaprol, oxides of nitrogen, nitrous acid or nitrates, compounds of copper, pyroligneous acid, or other added substance deleterious to health.

Section 4. That, for the purpose of this act, a non-alcoholic drink shall be deemed to be misbranded,—

First. If it be an imitation of, or offered for sale under, the distinctive name of another article, or if it is colored or flavored in imitation of the genuine color or flavor of another substance.

Second. If it be labeled or branded or tagged so as to deceive or mislead the purchaser.

Third. If the bottle or receptacle containing it, or its label, shall bear any statement, design, or device, regarding the ingredients or the substances contained therein, which statement, design, or device shall be false or misleading in any particular: Provided, That any non-alcoholic drink which does not contain any added poisonous or deleterious ingredients shall not be deemed to be adulterated or misbranded under the following conditions:—

A. In the case of mixtures or compounds which may be now, or from time to time hereafter, known as non-alcoholic beverages under their own distinctive names, and not an imitation of, or offered for sale under, the name of another article.

B. In the case of non-alcoholic beverages which are labeled, branded, or tagged so as to plainly indicate that they are compounds, imitations, or blends, and the word "Compound," "Imitation," or "Blend," as the case may be, is plainly stated on the container in which it is offered for sale: Provided, That the term "blend," as used herein, shall be construed to mean a mixture of like substances, not excluding harmless coloring or flavoring ingredients not prohibited by this act, and used for the purpose of coloring or flavoring only.

Section 5. Any person who shall violate any of the provisions of this act shall be guilty of a misdemeanor, and, upon conviction thereof, shall be sentenced to pay a fine of not less than twenty-five ($25) dollars, nor more than one hundred ($100) dollars.

Section 6. The Dairy and Food Commissioner shall be charged with the enforcement of the provisions of this act.

Section 7. All fines and penalties imposed and recovered for any violation of any of the provisions of this act shall be paid to the Dairy and Food Commissioner or his agent, and, when so collected and paid, shall thereafter be, by the Dairy and Food Commissioner, paid into the State Treasury, for the use of the Commonwealth.

Section 8. This act shall not apply to, nor in any way affect, the act, entitled "An act to prohibit the adulteration or coloring of milk or cream by the addition of so-called preservatives or coloring matter, and to provide for the enforcement of the same," approved the tenth day of June, Anno Domini one thousand eight hundred and ninety-seven; and the amendments thereto, approved the nineteenth day of April, Anno Domini one thousand nine hundred and one, entitled "An act to amend the first section of an act, entitled 'An act to prohibit the adulteration or coloring of milk and cream by the addition of so-called preservatives or coloring matter, and to provide for the enforcement of the same,' approved the tenth day of June, Anno Domini one thousand eight hundred and ninety-seven;" nor the act, entitled "An act regulating the manufacture or sale of fruit-syrups, providing for the enforcement thereof, and to repeal an act entitled 'An act relative to adulteration of natural fruit juice, and providing penalties for the violations thereof,' approved the second day of May, Anno Domini one thousand nine hundred and one," approved the twenty-sixth day of April, Anno Domini one thousand nine hundred and five,—which acts shall remain in full force.

Approved—The 11th day of March, A. D. 1909.

ICE CREAM ACT.

AN ACT

For the protection of the public health; and to prevent fraud and deception in the manufacture, sale, offering for sale, exposing for sale, and having in possession with intent to sell, of adulterated or deleterious ice cream; fixing a standard of butter-fat for ice cream; providing penalties for the violation thereof, and providing for the enforcement thereof.

Section 1. Be it enacted, &c., That no person, firm, or corporate body, by himself, herself, itself or themselves, or by his, her or their agents, servants, or employes, shall sell, offer for sale, expose for sale, or have in possession with intent to sell, ice-cream adulterated within the meaning of this act.

Section 2. Ice cream shall be deemed to be adulterated, within the meaning of this act,—

First. If it shall contain boric acid, formaldehyde, saccharin, or any other added substance or compound that is deleterious to health.

Second. If it shall contain salts of copper, iron oxid, orchres, or any coloring substance deleterious to health: Provided, That this paragraph shall not be construed to prohibit the use of harmless coloring matter in ice cream, when not used for fraudulent purposes.

Third. If it shall contain any deleterious flavoring matter, or flavoring matter not true to name.

Fourth. If it be an imitation of, or offered for sale under, the name of another article.

Section 3. Nothing in this act shall be construed to prohibit the use of fresh eggs, and not exceeding one-half of one per centum of pure gelatin, gum tragacanth, or other vegetable gums.

Section 4. No ice cream shall be sold within the State containing less than eight (8) per centum butter-fat, except where fruit or nuts are used for the purpose of flavoring, when it shall not contain less than six (6) per centum butter-fat.

Section 5. It shall not be lawful for any person, firm or corporate body to sell, offer for sale, expose for sale, or have in possession with intent to sell, any ice cream in any container which is falsely labeled or branded as to the name of the manufacturer thereof; or to misrepresent, in any way, the place of manufacture of ice cream or the manufacture thereof.

Section 6. Any person, firm, or corporate body who shall violate any of the provisions of this act shall be guilty of a misdemeanor.

and, upon conviction thereof, shall be sentenced to pay a fine of not less than twenty-five (25) dollars, nor more than fifty (50) dollars.

Section 7. The Dairy and Food Commissioner shall be charged with the enforcement of the provisions of this act.

Section 8. All fines and penalties imposed and recovered for the violation of any of the provisions of this act shall be paid to the Dairy and Food Commissioner or his agent, and, when so collected and paid, shall thereafter be, by the Dairy and Food Commissioner, paid into the State Treasury for the use of the Commonwealth.

Approved—The 24th day of March, A. D. 1909.

FRESH EGGS ACT.

AN ACT

For the protection of the public health, by prohibiting the sale, offering for sale, exposing for sale, or having in possession with intent to sell, of eggs unfit for food, as therein defined, and prohibiting the use of such eggs in the preparation of food products; providing penalties for the violation thereof, and providing for the enforcement thereof.

Section 1. Be it enacted, &c., That it shall be unlawful for any person, firm, or corporate body, by himself, herself, itself or themselves, or by his, her, its or their agents, servants or employes, to sell, offer for sale expose for sale, or have in possession with intent to sell, eggs that are unfit for food, within the meaning of this act.

Section 2. This act shall apply to eggs that, either before or after removal from the shell, are wholly or partly decayed or decomposed, and to eggs in the fluid state, any portion of which are wholly or partly decayed or decomposed, or that are mixed with parts of eggs that are derived from eggs that are wholly or partly decayed or decomposed. This act shall also apply to frozen masses or broken eggs, if the mass contains eggs that are wholly or partly decayed or decomposed, or that are mixed with parts of eggs that have been taken from eggs that were wholly or partly decayed or decomposed.

Section 3. That it shall be unlawful for any person, firm, or corporate body, by himself, herself, itself or themselves, or by his, her, its or their agents, servants, or employes, to use eggs that are either wholly or partly decayed or decomposed, in the preparation of food products: And providing further, That there shall be no delivery, sale, purchase, or acceptance of wholly or partly decayed or decomposed eggs in or at any establishment where food products are prepared or manufactured.

Section 4. That any person who shall violate any of the provisions of this act shall be guilty of a misdemeanor, and, upon conviction thereof, shall be sentenced to pay a fine of not less than two hundred (200) dollars, nor more than one thousand ($1,000) dollars, or to undergo an imprisonment of not less than three (3) months, nor more than nine (9) months, or both or either, at the discretion of the court.

Section 5. That the Dairy and Food Commissioner shall be charged with the enforcement of the provisions of this act.

Section 6. That all fines and penalties imposed and recovered for the violation of any of the provisions of this act shall be paid to the Dairy and Food Commissioner, or his agent, and, when so collected and paid, shall thereafter be, by the Dairy and Food Commissioner, paid into the State Treasury, for the use of the Commonwealth.

Approved—The 11th day of March, A. D. 1909.

LARD ACT.

AN ACT

To protect the public health, and prevent fraud and deception in the manufacture or sale of lard, lard substitutes, imitation lard, and lard compounds; providing penalties for the violation thereof, and providing for the enforcement thereof.

Section 1. Be it enacted, &c., That no person, firm, or corporate body, by himself, itself or themselves, or by his, her, its or their agents, servants or employes, shall within the State, manufacture, sell, offer for sale, expose for sale, or have in possession with intent to sell, lard which contains any ingredients other than the pure fat of swine, except as hereinafter provided.

Section 2. Imitation lard and lard substitutes, not containing any lard, may be made and sold, when offered for sale and sold under the distinctive trade-name thereof: Provided, however, That if said imitation lard or lard substitute is offered for sale or sold from a broken package, then the vessel, receptacle, or wrapper receiving the same, at the time of every sale, shall be plainly labeled or marked on the outside thereof, in letters at least one-half inch in length and plainly exposed to view, with the word "Imitation Lard" or "Lard Substitute," or the distinctive trade-name of the said article or substance: And provided further, That the said imitation lard or lard substitute shall not be composed of, or contain any article, substance, or ingredients deleterious to health.

Compounds composed of not less than fifty (50) per centum of pure lard, and other substance or substances not deleterious to health, may me made and sold, if the vessel, receptacle, or other wrapper receiving the same at the time of every sale thereof, is plainly marked or labeled on the outside thereof, in letters at least one-half inch in length and plainly exposed to view, with the words "Compound Lard."

Section 3. Any person, firm, or corporate body who shall violate any of the provisions of this act shall be guilty of a misdemeanor, and, upon conviction thereof, shall be sentenced to pay a fine of not less than fifty ($50) dollars, nor more than one hundred ($100) dollars.

Section 4. The Dairy and Food Commissioner shall be charged with the enforcement of the provisions of this act.

Section 5. All fines and penalties imposed and recovered for the violation of any of the provisions of this act shall be paid to the Dairy and Food Commissioner or his agent, and, when so collected and paid, shall thereafter be, by the Dairy and Food Commissioner, paid into the State Treasury, for the use of the Commonwealth.

Section 6. All acts or parts of acts inconsistent with the provisions of this act be and the same are hereby repealed.

Approved—The 11th day of March, A. D. 1909

ADULTERATION OR COLORING OF MILK AND CREAM.

AN ACT

To prohibit the adulteration or coloring of milk and cream by the addition of so-called preservatives or coloring matter, and to provide for the enforcement of the same.

Section 1. Be it enacted, &c., That if any person, firm or corporate body, by himself, herself, or themselves, or by his, her or their agents or servants, shall offer for sale, expose for sale, sell, or have in possession with intent to sell, for human consumption, milk or cream to which has been added boracic acid salt, boracic acid, salicylic acid, salicylate of soda, formaline, formaldehyde, sodium flouride, sodium benzoate, or any other compound or substance for the purpose of preserving or coloring the same, shall be deemed guilty of a misdemeanor, and upon conviction thereof in the court of quarter sessions of the proper county, shall be sentenced to pay a fine of not less than fifty nor more than one hundred dollars, or to undergo an imprisonment not exceeding sixty days, or both, at the discretion of the court.—Amendment of 19th of April, 1901.

Section 2. The agent of the Department of Agriculture, known as the Dairy and Food Commissioner, shall be charged with the enforcement of all the provisions of this act, and shall have all the power to enforce this act that is given him to enforce the provisions of the act by which he received his appointment.

Section 3. All penalties and costs for the violation of the provisions of this act shall be paid to the Dairy and Food Commissioner or his agent, and by him paid into the State Treasury, to be kept as a fund, separate and apart, for the use of the Department of Agriculture for the enforcement of this act, and to be drawn out upon the warrant signed by the Secretary of Agriculture and the Auditor General.

Section 4. All acts or parts of acts inconsistent with the provisions of this act are hereby repealed.

Approved—The 10th day of June, 1897.

VINEGAR ACT.

AN ACT

Providing for the regulation of the manufacture and sale of distilled and fermented vinegars, prescribing their standard, to prevent the adulteration of the same, providing for the enforcement thereof, and punishment for the violation of the same.

Section 1. Be it enacted, &c., That from and after the passage of this act no person, firm or corporate body shall manufacture for sale, offer for sale or expose for sale, sell or deliver, or have in his, her or their possession with intent to sell or deliver, any vinegar not in compliance with the provisions of this act. No vinegar shall be sold or exposed for sale as apple or cider vinegar which is not the legitimate product of pure apple juice, or vinegar not made exclusively of said apple cider, or vinegar in which foreign substances, drugs or acids shall have been introduced, as may appear upon proper test; no vinegar shall be branded fruit vinegar unless the same be made wholly from grapes, apples or other fruits.—Amendment of May 21, 1901.

Section 2. All vinegar made by fermentation and oxidation without the intervention of distillation, shall be branded "fermented vinegar," with the name of the fruit or substance from which the same is made. And all vinegar made wholly or in part from distilled liquor shall be branded as "distilled vinegar," and all such distilled vinegar shall be free from coloring matter, added before, during or after distillation, and from color other than that imparted to it by the process of distillation, and shall contain not less than four per centum, by weight, of absolute acetic acid. And all vinegar shall be made wholly from the fruit or grain from which it is represented to be made, and shall contain no foreign substance: Provided, That this shall not be construed to prohibit the use of such an amount of spices as are necessary for flavoring, provided such spices do not color the vinegar.—Amendment of 21st May, 1901.

Section 3. No person, firm or corporate body shall manufacture for sale, offer for sale, or have in his, her or their possession with intent to sell or expose for sale any vinegar found upon proper test to contain any preparation of lead, copper, sulphuric or other mineral acid, or other ingredients injurious to health. And all packages containing vinegar shall be plainly and distinctly marked on each head of the cask, barrel or keg containing such vinegar, or if sold in other packages, each package shall be plainly and distinctly marked with the name and residence of the manufacturer, together with the brand required in section two thereof.

Section 4. Every person, firm or corporate body who shall violate any of the provisions of this act shall, for every such offense, forfeit and pay not less than fifty dollars nor more than one hundred dollars, which shall be recoverable, with costs, including expense of inspection and analysis, by any person suing in the name of the Commonwealth as debts of like amount are by law recoverable: Provided, That the Department of Agriculture, through its officer known as the Dairy and Food Commissioner, together with the deputies, agents and assistants, shall be charged with the enforcement of this act, and shall have full access to all places of business, factories, mills, buildings, carriages, cars, vessels, barrels, tanks and packages of whatever kind used in the manufacture and transportation and sale of any vinegar, or of any adulteration or imitation thereof, or any package in which vinegar is mixed with articles of food. They shall also have power and authority to open any package, barrel or vessel containing any vinegar, or any adulteration or imitation thereof, which may be manufactured, sold or exposed for sale, and they shall also have full power and authority to take the samples therefrom for analysis upon tendering the value of said samples. And all charges, accounts and expenses of the Department for the enforcement of this act, through the said Commissioner and his deputies, agents, assistants, chemists, and counsel employed by him, in carrying out the provisions of this act, shall be paid by the Treasurer of the State in the same manner as other accounts and expenses of the said Department are paid. And all penalties and costs for the violation of the provisions of this act shall be paid to the said Dairy and Food Commissioner, or his agents, and by him immediately covered into the State Treasury, to be kept as a fund for the use of the Department, and to be drawn out upon the warrant signed by the Secretary of Agriculture and the Auditor General.

Section 5. Every person who violates any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than fifty dollars, nor more than one hundred dollars, or by imprisonment in the county jail for not less than ten or more than thirty days, or both fine and imprisonment for the first offense, and a fine of one hundred dollars and imprisonment for thirty days for every subsequent offense: Provided, That all fines and costs, including the expense of inspection and analysis imposed under this action, shall be covered into the State Treasury as provided by section four of this act, and all vinegar sold or offered for sale in violation of the provisions of this act shall be subjected to forfeiture and spoliation.

Section 6. Magistrates and justices of the peace throughout this Commonwealth shall have jurisdiction to hear and determine actions arising for violations of the provisions of this act, and to hold for court, or impose the penalties provided therein, subject to appeal as the law shall direct.

Section 7. All acts or parts of acts inconsistent with the provisions of this act are hereby repealed.

Approved—The 18th day of June, A. D. 1897.

CHEESE ACT.

AN ACT.

To prevent fraud and deception in the manufacture and sale of cheese, and define what shall constitute the various grades of cheese, providing rules and regulations for marking and branding the same, providing for the enforcement of this act, prescribing penalties for its violation.

Section 1. Be it enacted, &c., That no person, firm or corporate body shall manufacture, sell, or offer for sale or have in his or their possession with intent to sell, any cheese not the legitimate product of pure, unadulterated milk or cream, or any cheese into which any foreign fats or substances have been introduced as may appear upon proper test.

Section 2. All cheese manufactured or sold within this Commonwealth shall be divided into five grades, and shall be branded or stenciled in ordinary bold-face capital letters, not less than one-half inch in height, on one side of each cheese, and upon one side of the box or case containing the cheese, the manufacturer's name and postoffice address, and the words "Full cream," "Three-fourths Cream," "One-half Cream," "One-fourth Cream" and "Skimmed Cheese." All cheese branded "Full Cream," shall contain not less than thirty-two per centum of butter-fat, as may appear upon proper test. All cheese branded "Three-fourths Cream" shall contain not less than twenty-four per centum of butter-fat, as may appear upon proper test. All cheese branded "One-half Cream" shall contain not less than sixteen per centum of butter-fat, as may appear upon proper test. All cheese branded "One-fourth Cream" shall contain not less than eight per centum of butter-fat, as may appear upon proper test. All cheese containing less than eight per centum of butter-fat, as may appear upon proper test shall be branded "Skimmed Cheese:" Provided, however, That all full cream cheese sold, shipped or consigned to dealers outside of the Commonwealth of Pennsylvania may be branded, or stenciled, or not, as required by this act, at the option of the manufacturer.—Amendment of May 2, 1901.

Section 3. Every person, firm or corporation who shall violate any of the provisions of this act shall, for ever such offense, forfeit any pay the sum of not less than fifty dollars, nor more than one hundred dollars, together with all charges and expenses for inspection and analysis connected therewith, by any person suing therefor in the name of the Commonwealth, as debts of like amount are by law recoverable; and justices of the peace and aldermen throughout this Commonwealth shall have jurisdiction to hear and determine all actions arising under the provisions of this act, and all cheese not in accordance with this act shall be subject to forfeiture and spoliation: Provided, That the Department of Agriculture, through its officer, known as the Dairy and Food Commissioner, together with his deputies, agents and assistants, shall be charged with the enforcement of the provisions of this act, and shall have authority to enter any building or factory where the same is sold or manufactured or exposed for sale, and shall have the right to take samples sufficient for analysis, upon tendering the value thereof.

All fines and penalties, including also all charges for inspection and analysis, shall be paid to the Dairy and Food Commissioner, his deputies, agents or assistants, and by him immediately covered into the State Treasury, and so much of said fund as may be necessary for the enforcement of this act shall be drawn out upon warrants signed by the Secretary of Agriculture and Auditor General: Provided, That the provisions of this act shall not be construed to apply to such cheese as is known as "fancy" cheese and is under five pounds in weight, each; or to what is known as cottage cheese or pot cheese, and do not contain anything injurious to health.

Section 4. This act shall take affect sixty days after its approval by the Governor of the Commonwealth.

Approved—The 23d day of June, A. D. 1897.

FRUIT SYRUP ACT.

AN ACT

Regulating the manufacture or sale of fruit syrups, providing for the enforcement thereof, and to repeal an act, entitled "An act relative to adulteration of natural fruit juice, and providing penalties for violations thereof," approved the second day of May, Anno Domini one thousand nine hundred and one.

Section 1. Be it enacted, &c., That any person, firm, or corporate body who shall, by himself, herself, or themselves, or by his, her or their agents or servants, manufacture, sell, ship, consign, offer for sale or expose for sale, or have in possession with intent to sell, any fruit-syrup which contains formaldehyde, sulphurous acid or sulphites, boric acid or borates, salicylic acid or salicylates, saccharin, dulcin, glucin, betanapthol, abrastol, asaprol, fluorides, fluoborates, fluosilicates or other fluorine compounds; also any coal tar dyes, sulphate of copper, or any other coloring matter injurious to health, or any preservatives or their compounds injurious to health, shall be deemed guilty of a misdemeanor.

Section 2. Every person, firm or corporation, and every officer, agent, servant or employe of such person, firm or corporation, who violates any of the provisions of this act shall be deemed guilty of a misdemeanor, and, upon conviction thereof in the court of quarter sessions of the proper county, shall be sentenced to pay a fine of not less than sixty nor more than one hundred dollars, with the costs, or to undergo an imprisonment not exceeding sixty days, or both, at the discretion of the court.

Section 3. It shall be the duty of the Dairy and Food Commissioner to enforce the provisions of this act for which purpose he shall have the same power which is given to enforce the provisions of the act authorizing his appointment.

Section 4. All penalties or fines which may be recovered in any proceeding to enforce the provisions of this act shall be paid to the Dairy and Food Commissioner, or his agent, and by him paid into the State Treasury for the use of Commonwealth.

Section 5. The act, entitled "An act relative to adulteration of natural fruit juice, and providing penalties for violations thereof," approved the second day of May, Anno Domini one thousand nine hundred and one, be and the same is hereby repealed.

Approved—The 26th day of April, A. D. 1905.

OLEOMARGARINE ACT.

AN ACT

To prohibit the manufacture and sale of oleomargarine, butterine and other similar products, when colored in imitation of yellow butter; to provide for license fees to be paid by manufacturers, wholesale and retail dealers, and by proprietors of hotels, restaurants, dining rooms and boarding houses; for the manufacture and sale of oleomargarine, butterine, or other similar products, not colored in imitation of yellow butter; and to regulate the manufacture and sale of oleomargarine, butterine or other similar products, not colored in imitation of yellow butter, and to prevent and punish fraud and deception in such manufacture and sale as an imitation butter; and to prescribe penalties and punishment for violations of this act, and the means and the method of procedure for its enforcement, and regulate certain matters of evidence in such procedure.

Section 1. Be it enacted, &c., That no person, firm, or corporation shall, by himself, herself or themselves, or by his, her or their agent or servant, nor shall any officer, agent, servant or employe of any person, firm or corporation, manufacture, sell, ship, consign, offer for sale, expose for sale, or have in possession with intent to sell, oleomargarine, butterine, or any similar substance, article, product or compound, made wholly or partly out of any fats, oils or oleaginous substance, or compound thereof, not produced from pure, unadulterated milk, or cream from the same, without the admixture or addition of any fats foreign to the said milk or cream, and which shall be in imitation of yellow butter, produced from pure, unadulterated milk, or cream of the same, with or without coloring matter, unless such person, firm or corporation shall have first obtained a license and paid a license fee, as hereinafter provided; nor unless the said article, product or compound, so manufactured, shipped, consigned, offered for sale, exposed for sale, or had in possession with intent to sell, shall be made and kept free from all coloration or ingredients causing it to look like yellow butter; nor unless the same shall be kept and presented in a separate and distinct form, and in such manner as will advise the purchaser and consumer of its real character; nor unless such person, firm or corporation shall in all other respects comply with and observe the provisions of this act.

Section 2. Every person, firm or corporation, and every agent of such person, firm or corporation, desiring to manufacture, sell or offer, or expose for sale, or have in possession with intent to sell, oleomargarine, butterine, or any similar substance, not made or colored in imitation of yellow butter, shall make application for a license so to do, in such form as shall be prescribed by the Department of Agriculture through its agent, the Dairy and Food Commissioner; which application, in addition to other matters which may be required to be stated therein by said Dairy and Food Commissioner, shall contain an accurate description of the place where the proposed business is intended to be carried on, and the name and style under which it is proposed to conduct the said business. If the said application is satisfactory to the said Dairy and Food Commissioner, and said name and style shall not, in the judgment of the Dairy and Food Commissioner, be calculated to deceive or mislead the public as to the real nature of the business so proposed to be carried on, he shall issue to the applicant or applicants a license, authorizing him, her or them to engage in the manufacture or sale of oleomargarine, or butterine, or any similar substance, which shall not contain any coloration or ingredient that causes it to resemble or be in imitation of yellow butter; for which said license the applicant or applicants shall first pay; if a manufacturer, the annual sum of one thousand dollars; if a wholesaler, the annual sum of five hundred dollars; and if a retailer, the annual sum of one hundred dollars; if a proprietor of a hotel, restaurant or dining room, the annual sum of fifty dollars; and if a proprietor of a boarding house, the annual sum of ten dollars; and the said license fee, when received by the Dairy and Food Commissioner or his agent, shall be by him immediately covered into the State Treasury. Such licenses shall not authorize the manufacture or sale, exposing for sale, or having in possession with intent to sell, oleomargarine, butterine or any similar substance, at any other place than that designated in the application and license; and the said license shall not authorize the manufacture, sale, exposing for sale, or having in possession with intent to sell, any oleomargarine, butterine or any similar substance, made or colored so as to resemble or be in imitation of yellow butter.

All licenses under this act shall expire on the thirty-first day of December of each year, but licenses may be granted to commence on the first day of any month for the remainder of a year, upon payment of a proportionate part of the annual license fee; such licenses may be transferred by the Dairy and Food Commissioner upon the application in writing of the person, firm or corporation to which the same has been granted: Provided, The transferee shall comply with the regulations made by the said Dairy and Food Commissioner in regard to the said transfer, and shall thereafter comply with the provisions of this act.

Wholesale dealers, within the meaning of this act, shall be all persons, firms and corporations who shall sell to dealers, and persons who shall buy to sell again, and all persons, firms and corporations who make sales in quantities of ten pounds and over, at any time; and retail dealers shall be all persons, firms and corporations who shall sell in quantities less than ten pounds.

Section 3. After obtaining the license required by this act, the person, firm or corporation obtaining the same shall, before beginning any business under this said license, hang up and display, in a conspicuous place, on the walls of the room or store in which the oleomargarine, butterine or other similar substance is manufactured, sold or exposed for sale, the license so obtained as aforesaid; and shall also procure from the Department of Agriculture, through the Dairy and Food Commissioner, a sign or signs, which in number, size and lettering shall be as the Dairy and Food Commissioner shall direct, and which shall be uniform throughout the Commonwealth, clearly setting forth that he, she or they are engaged in the manufacture or sale of oleomargarine; which said sign or signs, when procured, shall be hung up in a conspicuous place or places on the walls of every room or store in which the oleomargarine, butterine or other similar substance is manufactured or sold. And in addition to such sign or signs, so hung up as aforesaid, every proprietor of a hotel, restaurant, dining room or boarding house, shall also have conspicuously placed, upon every counter or table at which food, meals or refreshments are served to customers, a placard plainly printed, in letters not less than one-half inch in length, stating that olemargarine is used and served to customers.

Section 4. It shall be unlawful for any person, firm or corporation or any agent thereof to sell, or offer or expose for sale, or have in possession with intent to sell, any oleomargarine, butterine or similar substance, not in imitation of yellow butter, which is not marked and distinguished, on the outside of each tub, package or parcel thereof, in a conspicuous place, by a placard with the word "OLEOMARGARINE" printed thereon; such placard to be placed in a conspicuous position, in full view of the purchaser, and the said word "OLEOMARGARINE" on such placard shall be printed in plain, uncondensed, Gothic letters, not less than one inch long, and such placard shall not contain any other words thereon. And there shall also be displayed upon every open tub, package or parcel containing such oleomargarine, butterine or any similar substance, not in imitation of yellow butter, in the same manner, in a conspicuous position, a placard with the word "OLEOMARGARINE" printed thereon, in the same form as above described in this section; and when oleomargarine, butter or other similar substance, not in imitation of yellow butter, is sold from such tub or package, or otherwise, at retail, in print, roll or other form, before being delivered to the purchaser it shall be wrapped in wrappers, plainly stamped on the outside thereof with the word "OLEOMARGARINE," printed or stamped thereon in letters one-fourth inch square; and said wrapper shall also contain the name and address of the seller and the quantity sold, and no other words thereon, and the said word "OLEOMARGARINE," so stamped or printed on the said wrapper, shall not be in any manner concealed, but shall be in plain view of the purchaser at the time of purchase.

Section 5. Every licensed manufacturer of oleomargarine, butterine or other similar product, not in imitation of yellow butter, and every licensed wholesale dealer therein, shall keep a book in which shall be entered accurately every sale and shipment of oleomargarine, butterine or other similar substance, not in imitation of yellow butter; giving the date of sale and shipment, the quantity, the person to whom sold and shipped, the place to which shipped, and the name of the transportation line by which shipped; which book shall always be open to the examination of the Dairy and Food Commissioner, his agents, attorneys and representatives. Every licensed retail dealer in oleomargarine, butterine or similar substance, not in imitation of yellow butter, shall keep an accurate account, in a book open to the examination of the Dairy and Food Commissioner, his agents, attorneys and representatives, in which shall be entered the date of the receipt of all purchases of oleomargarine, butterine or any similar substance, made by such retail dealer; stating therein where, when and from whom purchased, and the quantity; and the said books, so to be kept by manufacturers, wholesale and retail dealers, shall be in such form as the Dairy and Food Commissioner shall direct.

Section 6. Every person, firm or corporation, and every officer, agent, servant and employe of such person, firm or corporation, who shall manufacture, sell or offer, or expose for sale, or have in possession with intent to sell, oleomargarine, butterine or any similar substance, in violation of any of the provisions of this act; or who shall sell oleomargarine, butterine, or any similar substance, as or for butter; or who shall fail to keep a book, in accordance with the last preceding section; or who shall, in any other respects, violate any of the provisions of this act, shall for every such offense forfeit and pay the sum of one hundred dollars, which shall be recovered, with the costs, including the expense of analysis, by any person suing in the name of the Commonwealth, as debts of like amount are by law recoverable; and justices of the peace and aldermen throughout this Commonwealth shall have jurisdiction to hear and determine all actions for recovery of said penalties, with the right to either party to appeal to the court of common pleas, as provided in existing laws in suits for penalties. And all penalties and costs imposed and recovered under the provisions of this act shall be paid to the Dairy and Food Commissioner, or his agents, and by him immediately covered into the State Treasury, to be paid out and used as hereinafter provided.

Section 7. In addition to the above penalty, every person, firm or corporation, and every officer, agent, servant or employe of such person, firm or corporation, who violates any of the provisions of this act shall also be guilty of a misdemeanor; and upon conviction thereof, shall be punished for the first offense by a fine of not less than one hundred dollars, nor more than five hundred dollars, or by imprisonment in the county jail for not more than three months, or both, at the discretion of the court; and upon conviction of any subsequent offense, shall be punished by a fine of not less than five hundred dollars, nor more than one thousand dollars, and by imprisonment in the county jail for not less than six months nor more than twelve months.

Section 8. In any proceeding under this act, either for the collection of a penalty or a prosecution for a misdemeanor, the certificate of the Dairy and Food Commissioner and the Secretary of Agriculture, under the seal of the Department of Agriculture, shall be accepted by the justices of the peace, aldermen, and courts of record, as evidence of the granting of licenses to manufacture or sell oleomargarine or butterine, or of the fact that no such license has been granted to any particular person, firm or corporation.

Section 9. Whenever a suit for the collection of a penalty, under the provisions of this act, shall be appealed to any court of record, or whenever any prosecution for a misdemeanor on account of any violation of the provisions of this act has been returned to any court of quarter sessions, it shall be lawful for the Dairy and Food Commissioner, his agents or attorneys, in case the person or persons who have been sued for such penalty, or prosecuted for such misdemeanor, having since the commencement of such suit or prosecution again violated any of the provisions of this act, to apply to the court having jurisdiction of such appeal or of such prosecution, or to any law judge thereof, by petition, setting forth the facts, and asking the said court to make an order commanding and restraining the person or persons, so sued or prosecuted as aforesaid, from further violating any of the provisions of this act until such time as the said suit for penalty or the said prosecution shall have been finally decided and determined; and thereupon the said court, or any law judge thereof, after such notice to such person or persons, so sued or prosecuted as aforesaid, as to the said court or judge may appear proper, and after inquiring into the facts alleged in said petition, shall, if satisfied that any violation of the provisions of this act have been committed by such person or persons since the commencement of said suit or prosecution, make an order commanding and restraining the said person or persons from any further violation of the provisions of this act until such time as the said suit or prosecution shall have been finally decided and determined; and in case, upon the final determination of said suit or prosecution, it shall appear that the said person or persons had incurred the liability to payment of the penalty for which suit had been so brought, or has been duly convicted of a misdemeanor in the prosecution so commenced as aforesaid, the said court or law judge thereof shall make the aforesaid order, restraining the said person or persons from further violation of the provisions of this act, continuing and permanent; and any violation by any person or persons of any such restraining order of such court or judge, whether the said restraining order shall be made during the pendency of a suit for penalty or of a prosecution as above stated, or after the final determination of such suit or prosecution in the manner aforesaid, shall be punishable as a contempt of the court so making the said order; and the said court is hereby authorized to take such steps for the punishment of such contempt as may by law be now taken for disregarding any injunction or other order of the courts of common pleas of this Commonwealth, sitting in equity and exercising equity jurisdiction. No security shall be required on the part of the petitioner for such restraining order, and the cost of the application and subsequent proceedings thereon shall be in the discretion of the court.

Section 10. It shall be the duty of every constable in any city, borough, ward or township of this Commonwealth, having knowledge of any violation of this act, or whenever requested so to do by the Dairy and Food Commissioner, his agent, or attorney, or by any citizen of this Commonwealth, to make report to the court of quarter sessions of the proper county, as part of his quarterly report and return to said court, of the name of every person, firm or corporation known by him to have violated any of the provisions of this act, or alleged by the person so giving notice as aforesaid to said constable to have violated any of the provisions of this act and the names of all witnesses furnished to said constable, whose testimony it is alleged will sustain or prove the fact of such violation; and it shall be the duty of the judge of the said court to make inquiry of all constables, at the time of making their quarterly returns to the court of quarter sessions, as to whether they have knowledge, and whether notice has been given to them, respectively, of any violation of this act, in accordance with the terms of this section; and whenever such quarterly reports shall contain the name of any persons alleged to have violated the provisions of this act, together with the names of witnesses to prove such violations, as also the name of the person giving notice to the constable as aforesaid, the said court shall direct the district attorney to prepare an indictment against every person so named, and call and send the witnesses, whose names have been so returned, before the grand jury then sitting, in support of the said indictment; and if a true bill shall be returned by the grand jury, thereupon to issue summary process to bring the person so charged to answer the matters alleged in such prosecution, and thereupon proceed to trial as speedily as possible, according to the course of practice in the said court of quarter sessions.

Section 11. The Dairy and Food Commission shall be charged with the enforcement of all the provisions of this act; but any citizen of the Commonwealth, having knowledge, or information of the violation of any of the provisions of this act, may, in the name of the Commonwealth, begin a suit for penalty or prosecution for misdemeanor in accordance with the provisions of this act, and may prosecute to final judgment any such suit or prosecution, giving notice in writing, however, to the Dairy and Food Commissioner of the commencement of such suit or prosecution, immediately upon commencement of the same, stating the nature of the proceeding and the magistrate before whom commenced; and shall, in like manner, report to the Dairy and Food Commissioner each successive step taken in such suit or prosecution; and such citizen shall, upon complying with the provisions of this section, be entitled to receive one-half of any penalty or fine which may be recovered in such proceeding and paid to the Dairy and Food Commissioner; and immediately upon the receipt and covering into the treasury of any such penalty or fine, recovered and paid in any proceeding commenced by a citizen as aforesaid, the Dairy and Food Commissioner shall pay the one-half thereof to the said citizen, so commencing said proceedings and complying with the provisions of this section. Such citizen shall also be entitled to recover from the defendant his witness fees and other legal costs as fixed by law, in said proceeding.

Section 12. The money paid into the Treasury under the provisions of this act shall constitute a special fund, for the use of the Department of Agriculture in enforcing this law; and may be drawn out upon warrants signed by the Secretary of Agriculture and approved by the Auditor General, subject, however, to the payment to any citizen commencing and successfully prosecuting a proceeding for any violation of this act, under the last preceding section, of one-half of the penalty or fine so recovered in such proceedings and paid into the State Treasury.

Section 13. The Dairy and Food Commissioner, his assistants, agents, experts, chemists, detectives and counsel, duly appointed by him for the purpose, shall have full access, egress and ingress to all places of business, factories, farms, buildings, carriages, cars, vessels and cans, used in the manufacture, transportation and sale of any dairy products, or of any adulteration or imitation thereof; and shall also have power and authority to open any package, can or vessel containing, or which may be supposed to contain, oleomargarine, butterine or other similar substance, or any adulteration or imitation of butter, which may be manufactured, sold or exposed for sale in violation of any of the provisions of this act, or of any act which may be hereafter enacted in relation to butter or the adulteration or imitation thereof; and they shall also have power to take from such package, can or vessel samples for analysis, upon paying or tendering the value of such samples.

Section 14. The Dairy and Food Commissioner shall publish a semi-annual bulletin, and distribute the same in the same manner as other bulletins of the Department of Agriculture are published and distributed; which semi-annual bulletin shall contain the name and address of every person, firm or corporation to whom a license has been issued for the manufacture or sale of oleomargarine, butterine or other similar substance; and, also a tabulated statement of all the actions, civil or criminal, which have been brought for the violation of this act, giving the name and address of the defendant, and the disposition of every such case.

Section 15. All acts or parts of acts inconsistent with this act are hereby repealed; but the repeal of said acts shall not in any way interfere with, or prevent the prosecution to final termination of, any actions, civil or criminal, now pending or which may hereafter be commenced, for any violation of said acts which has already been committed.

Approved—The 29th day of May, A. D. 1901.

RENOVATED OR PROCESS BUTTER ACT.

AN ACT

Defining boiled or process butter; designating the name by which it shall be known; providing for the licensing of manufacturers and dealers therein, and regulating the sale and labeling of the same so as to prevent fraud and deception in its sale; providing punishment for violations of this act, the methods of procedure for its enforcement, and certain matters of evidence in such procedure.

Section 1. Be it enacted, &c., That for the purposes of this act certain food products, usually known as "boiled" or "process" butter, produced by taking original packing stock and other butter and melting the same so that the butter oil can be drawn off, mixed with milk or skimmed milk or other material, and by emulsion or other process, produce butter, and butter produced by any similar process, and commonly known as "boiled" or "process" butter; and which "boiled" or "process" butter for the purpose of this act shall be known and designated as "renovated butter."

Section 2. Every person, firm or corporation, and every agent of such person, firm or corporation, who shall desire to engage in the business of manufacturing or selling "renovated butter," shall first make application to the Department of Agriculture for a license, authorizing him, her or them to engage in the manufacture or sale of "renovated butter," and such application for license shall be in such form as shall be prescribed by the Department of Agriculture through its agent, the Dairy and Food Commissioner; which application, in addition to other matters which may be required to be stated therein by the said Dairy and Food Commissioner, shall contain an accurate description of the place where the proposed business is intended to be carried on, and the name and style under which it is proposed to conduct the said business, which name and style shall not, in the judgment of the Dairy and Food Commissioner, be calculated to deceive or mislead the public as to the real nature of the business so proposed to be carried on; and if the said application is satisfactory to the said Dairy and Food Commissioner, he shall issue to the applicant or applicants a license, authorizing him, her or them to engage in the manufacture or sale of "Renovated Butter," for which said license the applicant or applicants shall first pay, annually, the following sum; if a manufacturer, the annual sum of one thousand ($1,000) dollars; if a wholesale dealer, the annual sum of five hundred ($500) dollars; if a retailer, the annual sum of one hundred ($100) dollars; if a restaurant keeper or dining room proprietor or a hotel proprietor, the annual sum of fifty ($50) dollars; if a boarding house keeper, the annual sum of ten ($10) dollars; and the said license fees, when received by the said Dairy and Food Commissioner or his agent, shall be by him immediately paid into the State Treasury. All licenses under this act shall expire the thirty-first day of December of each year, but licenses may be granted to begin on the first of any month for the remainder of a year, upon the payment of a proportionate part of the annual license fee. Wholesale dealers, within the meaning of this act, shall be all persons, firms or corporations who shall sell to dealers, and persons who shall buy to sell again, and all persons, firms and corporations who make sales in quantities of ten pounds and over at any time. An agent of a manufacturer located outside of the State, and taking orders within this State for such "Renovated butter," to be delivered from the factory or from a storagehouse, or from one place of business to another within this State, shall be, within the meaning of this act, a wholesale dealer. And retail dealers shall be all persons, firms or corporations who sell in quantities of less than ten pounds. Every restaurant keeper or dining room proprietor or hotel proprietor or boarding house keeper, who furnishes "Renovated Butter" as part of the meal served to customers or guests shall be regarded as a dealer in "Renovated Butter." Such license may be transferred by the Dairy and Food

Commissioner, upon the application in writing of the person, firm or corporation to which the same has been granted, provided the transferee shall comply with the provisions of this act and with the regulations made by the said Dairy and Food Commissioner in regard to the said transfer. Such license shall not authorize the manufacture or sale, exposing for sale or having in possession with intent to sell, "Renovated Butter" at any place other than that designated in the application and license. The license, procured as aforesaid, shall be hung up in a conspicuous place, in the place of business, room or store where such "Renovated Butter" is authorized to be sold.

Section 3. That no person, firm or corporation shall sell or offer or expose for sale, or have in his, her or their possession with intent to sell, any "Renovated Butter" from a wagon or other vehicle, or upon the public streets or roads, or from house to house.

Section 4. Every person, firm or corporation who shall obtain a license for the manufacture or sale of "Renovated Butter" shall also be required, before engaging in such manufacturing or sale, to procure from the Dairy and Food Commissioner a sign or signs, of such form, size and lettering as the Dairy and Food Commissioner shall determine, and which shall be uniform throughout the Commonwealth; which said sign or signs shall clearly set forth that he, she or they are engaged in the manufacture or sale of "Renovated Butter," and which sign or signs when procured shall be hung up in a conspicuous place or places, on the walls of each room or store or place of business in which "Renovated Butter" is manufactured or sold; and in addition to such sign or signs, so hung up as aforesaid, every restaurant keeper or dining room proprietor, or hotel proprietor or boarding house keeper, shall also have conspicuously placed upon every counter or table, at which food, meals or refreshments are served to customers, a placard, plainly printed in letters not less than one-half inch in length, stating that "Renovated Butter" is used and served to customers. Every person, firm or corporation who shall obtain a license as a manufacturer or wholesale dealer, for the manufacture or sale of renovated butter, shall also be required, before engaging in such manufacture or sale, to procure from the Dairy and Food Commissioner a stencil, of such form, size and lettering as the Dairy and Food Commissioner shall determine, and which shall be uniform throughout the Commonwealth; which said stencil shall designate the number of the said license and the name and address of the holder thereof; which said stencil shall be used by the manufacturer or wholesale dealer, and said stencil brand shall be placed on each and every package, before being sold by the manufacturer or wholesale dealer to the retailer. If any package of renovated butter shall be found in the possession of any manufacturer or wholesale dealer or retail dealer without the said stencil brand being found thereon, such package shall be seized by the Dairy and Food Commissioner or by any of his agents, and said package shall be forfeited, and shall be sold by the Dairy and Food Commissioner or his agents, and the proceeds thereof paid to the State Treasurer, for the use of the Department of Agriculture.

Section 5. It shall be unlawful for any person, firm or corporation, or any agent thereof, to sell, or offer or expose for sale, or have in his, her or their possession with intent to sell, any "Renovated Butter," not marked and distinguished on the outside of each tub, package or parcel thereof, in a conspicuous place, by a placard with the words "Renovated Butter;" and such placard shall be printed in plain, uncondensed Gothic letters, not less than one-half inch long, and such placards shall not contain any other words, printing or device thereon; and also, upon every open tub, package or parcel, containing such "Renovated Buttter," there shall be displayed in the same manner, in a conspicuous place, a placard with the words "Renovated Butter" printed thereon, in the same form as above described in this section, and when "Renovated Butter" is sold from such package, or otherwise, at retail, in print, or roll or other form, before being delivered to the purchaser it shall be wrapped in wrappers, plainly stamped on the outside thereof with the words "Renovated Butter," printed or stamped thereon in letters one-quarter of an inch square, and such wrapper shall contain no other words or printing thereon; and the said words "Renovated Butter," so stamped or printed on the said wrapper, shall not be in any manner concealed, but shall be in plain view of the purchaser at the time of purchase.

Section 6. Every person, firm or corporation who shall have obtained a license, and be engaged in the business of manufacturer or wholesale dealer in "Renovated Butter," shall keep a book, in which shall be entered accurately every sale and shipment, the quantity and person to whom sold and shipped, and place to which shipped, and the name of the transportation line by which shipped; which said book shall be always open to the inspection of the Dairy Dairy and Food Commissioner, or his agents, attorneys and representatives. Every retail dealer in "Renovated Butter" shall keep an accurate account, in a book open to the examination of the Dairy and Food Commissioner, his agents, attorneys and representatives, in which said book shall be entered the date of the receipt of all purchases of "Renovated Butter" made by such retail dealer, stating therein where and from whom purchased, and the quantity so purchased.

Section 7. Every person, firm or corporation, and every agent of such person, firm or corporation, who shall manufacture, sell or offer, or expose for sale, or have in his, her or their possession with intent to sell, "Renovated Butter," in violation of any of the provisions of this act, or who shall in any other respects violate any of the provisions of this act, shall for every offense forfeit and pay the sum of one hundred ($100) dollars, which shall be recoverable with the costs, including the expenses of the inspection and analysis, by any person suing in the name of the Commonwealth, as debt of like amount are by law recoverable; and justices of the peace and aldermen, throughout this Commonwealth, shall have jurisdiction to hear and determine all actions for recovery of penalties for violations of the provisions of this act, with the right of appeal in either party to the court of common pleas, as provided in existing laws in suits for penalties; and all penalties and costs imposed and recovered under the provisions of this act, shall be paid to the Dairy and Food Commissioner or his agents, and by him immediately covered into the State Treasury, to be paid out and used as hereinafter provided.

Section 8. In addition to the above penalty, every person, firm or corporation, and every agent of such person, firm or corporation, who violates any of the provisions of this act shall be deemed guilty of a misdemeanor, and, upon conviction shall be punished for the first offense by a fine of not less than one hundred ($100) dollars, nor more than three hundred ($300) dollars, or by imprisonment in the county jail for not more than thirty (30) days, or both, at the discretion of the court: and for the second offense, by a fine of not less than three hundred ($300) dollars and not exceeding five hundred ($500) dollars, and imprisonment not exceeing (2) two years.

Section 9. In any proceedings under this act, either for the collection of a penalty or prosecution for a misdemeanor, the certificate of the Dairy and Food Commissioner and the Secretary of Agriculture, under the seal of the Department of Agriculture, shall be accepted by justices of the peace, aldermen and courts of record as evidence of the granting of a license to manufacture or sell "Renovated Butter," or of the fact that no such license has been granted to any particular person, firm or corporation.

Section 10. Whenever a suit for the collection of a penalty, under the provisions of this act, shall be appealed to any court of record, or whenever any prosecution for a misdemeanor, on account of any violation of the provisions of this act, has been returned to any court of quarter sessions, it shall be lawful for the Dairy and Food Commissioner, his agents or attorneys, in case the person or persons who have been sued for such penalty or prosecuted for such misdemeanor have, since the commencement of such suit or prosecution, again violated any of the provisions of this act, to apply to the court having jurisdiction of such appeal or of such prosecution, or to any law judge thereof, by petition setting forth the facts, and asking the said court to make an order commanding and restraining the person or persons, so sued or prosecuted as aforesaid, from further violating any of the provisions of this act until such time as the said suit for penalty or the said prosecution shall have been finally decided and determined: and thereupon the said court, or any law judge thereof, after such notice to such person or persons, so sued or prosecuted as aforesaid, as to the said court or judge may appear proper and after inquiring into the facts alleged in said petition shall, if satisfied that any violation of the provisions of this act has been committed by such person or persons since the commencement of said suit or prosecution, make an order, commanding and restraining the said person or persons from any further violations of the provisions of this act, until such time as the said suit or prosecution shall have been finally decided and determined; and in case, upon the final determination of said suit or prosecution, it shall appear that the said person or persons had incurred the liability to payment of the penalty for which said suit had been so brought, or has been duly convicted of a misdemeanor in the prosecution so commenced as aforesaid, the said court or law judge thereof shall make the aforesaid order, restraining the said person or persons from the further violation of the provisions of this act, continuing and permanent; and any violation by any person or persons of any restraining order of such court or judge, whether the restraining order shall be made during the pendency of a suit for penalty, or a prosecution as above stated, or after the final determination of such suit or prosecution in the manner aforesaid, shall be punishable as a contempt of the court so making the said order. And the said court is hereby authorized to take such steps for the punishment of such contempt as may by law be now taken for disregarding any injunction or other order of the courts of common pleas of this Commonwealth sitting in equity and exercising equity jurisdiction. No security shall be required on the part of the petitioner for such restraining order, and the costs of the application and subsequent proceedings thereon shall be in the discretion of the court.

Section 11. It shall be the duty of every constable in any city, borough, ward or township of this Commonwealth, having knowledge of any violation of this act, or whenever requested so to do by the Dairy and Food Commissioner, his agents or attorneys, or by any citizen of this Commonwealth, to make report to the court of quarter sessions of the proper county, as part of his quarterly report and return to said court, of the name of every person, firm or corporation known by him to have violated any of the provisions of this act, or alleged by the person, so giving notice as aforesaid to said constable, to have violated any of the provisions of this act, and of the names of all witnesses, furnished to said constable, whose testimony it is alleged will sustain and prove the fact of such violation. And it shall be the duty of the judge of the said court to make inquiry of all constables, at the time of the making of their quarterly returns to the court of quarter sessions, as to whether they have knowledge, and whether notice has been given to them, respectively, of any violation of this act, in accordance with the terms of this section; and whenever such quarterly report shall contain the name of any person alleged to have violated the provisions of this act, together with the names of witnesses to prove such violation, and also the name of the person giving notice to the constable, as aforesaid, the said court shall direct the district attorney to prepare an indictment against every person so named, and call and send the witnesses, whose names have been so returned, before the grand jury then sitting, in support of the said indictment; and if a true bill shall be returned by the grand jury, thereupon to issue summary processes to bring in the person so charged, to answer the matters alleged in such indictment, and thereupon proceed to trial as speedily as possible, according to the course of practice in the said court of quarter sessions.

Section 12. The Dairy and Food Commissioner shall be charged with the enforcement of all the provisions of this act; but any citizen of the Commonwealth, having knowledge or information of the violation of any of the provisions of this act, may, in the name of the Commonwealth, begin a suit for penalty or prosecution for misdemeanor, in accordance with the provisions of this act, and may prosecute to final judgment any suit or prosecution, giving notice in writing, however, to the Dairy and Food Commissioner of the commencement of such suit or prosecution immediately upon the commencement of the same, stating the nature of the proceeding and the magistrate before whom commenced, and shall in like manner report to the Dairy and Food Commissioner each successive step taken in such suit or prosecution; and such citizen shall, upon complying with the provisions of this section, be entitled to receive one-half of any penalty or fine which may be recovered in such proceeding and paid to the Dairy and Food Commissioner; and immediately upon the receipt and covering into the treasury of any such penalty or fine, recovered and paid in any proceeding commenced by a citizen, as aforesaid, the Dairy and Food Commissioner shall pay the one-half thereof to the said citizen, so commencing said proceeding and complying with the provisions of this section. Such citizen shall also be entitled to recover from the defendant his witness fees and other legal costs, as fixed by law, in said proceeding.

Section 13. The money paid into the treasury under the provisions of this act shall constitute a special fund, for the use of the Department of Agriculture in enforcing this law, and may be drawn out upon warrants signed by the Secretary of Agriculture and approved by the Auditor General; subject, however, to the payment to any citizen commencing and successfully prosecuting a proceeding for any violation of this act, under the last preceding section, of one-half of the penalty or fine so recovered in such proceeding and paid into the State Treasury.

Section 14. The Dairy and Food Commissioner, his assistants, agents, experts, chemists, detectives and counsel, duly appointed by him for the purpose, shall have full access, egress and ingress to all places of business, factories and farm buildings, carriages, cars, vessels and cans, used in the manufacture, transportation and sale of any dairy products, or of any adulteration or imitation thereof; and shall also have power and authority to open any package, can or vessel containing, or which may be supposed to contain, renovated butter, which may be manufactured, sold or exposed for sale in violation of any of the provisions of this act; and they shall also have power to take from such package, can or vessel, samples for analysis, upon paying or tendering the value of such samples.

Section 15. The Dairy and Food Commissioner shall publish a semi-annual bulletin, and distribute the same in the same manner as other bulletins of the Department of Agriculture are published and distributed; which semi-annual bulletin shall contain the name and address of every person, firm or corporation to whom a license has been issued for the manufacture or sale of renovated butter and also a tabulated statement of all actions, civil or criminal, which have been brought for the violation of this act; giving the name and address of the defendant, and the disposition of every case.

Section 16. All parts of the act approved the fourth day of May, Anno Domini one thousand eight hundred and ninety-nine, entitled "An act to regulate the sale of butter, produced by taking original packing stock and other butter .and melting the same so that the butter oil can be drawn off, mixed with skimmed milk or other material, and by emulsion or other process produce butter, and butter produced by any similar process, and commonly known as "Boiled" or "Process" butter; providing for the enforcement thereof, and punishment for the violation of the same;" inconsistent with this act, are hereby repealed.

Approved—July 10, 1901.

FRESH MEAT, POULTRY, GAME AND FISH ACT.

AN ACT

To prohibit the selling, shipping, consigning, offering for sale, exposing for sale, or having in possession with intent to sell, as fresh, any meat, poultry, game, fish, or shell fish which contains any substance or article possessing a preservative or coloring character or action; making the same a misdemeanor; and to prescribe penalties and punishment for violation, and the means and the methods of procedure for the enforcement thereof.

Section 1. Be it enacted, &c., That if any person, firm or corporate body shall, by himself, herself or themselves, or by his, her, or their or its, agents or servants, sell, ship, consign, offer for sale, expose for sale, or have in possesion with intent to sell, as fresh any meat, poultry, game, or shell fish which contains any substance, article or ingredient possessing a preservative character or action, or which contains any coal-tar dye, or any other substance or ingredient possessing a coloring character or action, shall be deemed guilty of a misdemeanor; and, upon conviction thereof in the court of quarter sessions of the peace of the proper county, shall be sentenced to pay a fine of not less than one hundred dollars nor more than two hundred dollars, and all costs, or to undergo an imprisonment in the county jail of not less than sixty days nor more than ninety days, or both, at the discretion of the court: and, upon conviction of any subsequent offense, shall be punished by a fine of not less than two hundred dollars nor more than five hundred dollars, or be imprisoned not less than sixty days nor more than four months, or both or either, at the discretion of the court: Provided, That nothing in this section shall prohibit the use of ice as a preservative, or proper refrigeration.

Section 2. The Dairy and Food Commissioner shall be charged with the enforcement of all provisions of this act; and all penalties which may be recoverable, and all fines which may be paid, in any preceeding or proceedings to enforce the provisions of this act, shall be paid to the Dairy and Food Commissioner, or his agent, and by him paid into the State Treasury; and the money so paid shall constitute a special fund, for the use of the Dairy and Food Commissioner in enforcing this act, and may be drawn out upon warrants signed by the Dairy and Food Commissioner or Secretary of Agriculture, and approved by the Auditor General.

Section 3. All acts or parts of acts inconsistent with this act are hereby repealed; but the repeal of said acts shall in no way interfere with, or prevent the prosecution to final termination of, any action or prosecution now pending, or which may be hereafter commenced for any violation of said acts, which has already been committed.

Approved—The 28th day of March, A. D. 1905.

IMITATION DAIRY PRODUCTS IN PENAL AND CHARITABLE INSTITUTIONS.

AN ACT

To prohibit the use of any adulteration or imitation of dairy products in any charitable or penal institution, being supplementary to an act, entitled "An act for the protection of the public health and to prevent adulteration of dairy products and fraud in the sale thereof," approved May twenty-one, Anno Domini one thousand eight hundred and eighty-five.

Section 1. Be it enacted, &c., That it shall not be lawful for any charitable or penal institution in the State of Pennsylvania to use, or furnish to its inmates, any substance, the manufacture or sale of which is prohibited by section one of the act, entitled "An act for the protection of the public health and to prevent the adulteration of dairy products and fraud in the sale thereof," approved May twenty-first, Anno Domini one thousand eight hundred and eighty-five.

Section 2. That any officer, agent, steward or other official of any such charitable or penal institution, who shall knowingly buy any substance the manufacture or sale of which is prohibited by section one of the said act of May twenty-one, Anno Domini one thousand eight hundred and eighty-five, for use in such charitable or penal institutions, or who shall knowingly cause such substance to be used by the inmates of such charitable or penal institution, shall be deemed guilty of a misdemeanor, and upon conviction shall be punished by a fine not exceeding one thousand dollars, or imprisonment not exceeding two years for each offense, or either or both at the discretion of the court.

Section 3. Every person who shall knowingly sell or offer for sale, to and officer, agent, steward or other official of any charitable or penal institution, any substance, the manufacture or sale of which is prohibited by section one of the said act of May twenty-first, Anno Domini one thousand eight hundred and eighty-five, for use in such charitable or penal institution, shall be deemed guilty of a misdemeanor, and upon conviction, shall be punished by a fine not exceeding one thousand dollars, or by imprisonment not exceeding two years, or either or both at the discretion of the court.

Approved—The 23rd day of May, A. D. 1893.

DIGEST OF DECISIONS RELATIVE TO FOOD LAWS.

CONSTITUTIONALITY OF FOOD LEGISLATION IN GENERAL.

The general purposes of food legislation are usually two-fold:

1. To protect the public health.
2. To prevent fraud and deception.

Legislation designed for the purposes stated or either of them, is a valid exercise of the police power of the state and as such is constitutional.

Powell vs. Commonwealth, 114 Pa. 265, affirmed by the United States Supreme Court in Powell vs. Pennsylvania, 127 U. S. 678, is the leading case in Pennsylvania upon the question of what is a valid exercise of the police power. In this case the Supreme Court says:

"Speaking of the prohibitory liquor law of Massachusetts passed in 1869, the Supreme Court of the United States says: 'If the public safety or the public morals require the discontinuance of any manufacture or traffic, the hand of the legislature can not be stayed from providing for its discontinuance by any incidental inconvenience which individuals or corporations may suffer. All rights are held subject to the police power of the state. * * * * * * Whatever differences of opinion may exist as to the extent and boundaries of the police power, and however difficult it may be to render a satisfactory definition of it, there seems to be no doubt that it does extend to the protection of the lives, health and property of the citizens and to the preservation of good order and the public morals. The legislature can not, by any contract, divest itself of the power to provide for these objects. They belong emphatically to that class of objects which demand the application of the maxim, *salus populi suprema lex,* and they are to be attained and provided for by such appropriate measures as the legislative discretion may devise. That discretion can no more be bargained away than the power itself:' Beer Co. vs. Massachusetts, 97 U. S. 25."

"The test of the reasonableness of a police regulation prohibiting the making and vending of a particular article of food is not alone whether it is in part unwholesome and injurious. A prohibition may stand as a reasonable police regulation for the benefit of the public, if we believe that the only way to prevent the public being defrauded into purchasing the counterfeit article for the genuine is by such a prohibition. The fact that scientific experts may pronounce a manufactured product intended for human food to be wholesome and not injurious, and that in a pure state it may thus be good for food does not render it incompetent for the legislature to prohibit the manufacture and sale of the article, if in the judgment of the legislature, and not of the courts, it be necessary for the protection of the lives, health and property of the citizens and to the preservation of good order and the public morals."

"In creating a legislative department and conferring upon it the legislative power, the people must be understood to have conferred the full and complete authority as it rests in and may be exercised by the sovereign power of any state, subject only to such restrictions as they have seen fit to impose and to the limitations which are contained in the Constitution of the United States. The legislative department is not made a special agency for the exercise of specially defined legislative powers, but is entrusted with the general authority to make laws at discretion."

For the general principles as to legislative power possessed by the General Assembly of the state, see authorities cited and discussion by Mitchell, J., in

> Commonwealth vs. Moir, 199 Pa. (1901), and opinion of Rice P. J. adopted by the Supreme Court in Com. vs. Herve, 229 Pa. 132.

THE STATE HAS THE CONSTITUTIONAL POWER TO ESTABLISH STANDARDS FOR FOOD AND DEFINE FOOD TERMS.

People vs. Clippery, 4 N. E. Rep. 107 reversing S. C. reported in 37 Hunter (N. Y.) 319.

People vs. Eddy, 59 Hunter (N. Y.) 615.
People vs. Hodient, 68 Hunter (N. Y.) 23.
Com. vs. Luscomb, 130 Mass., 42.
Com. vs. Evans, 132 Mass., 11.
People vs. Schaeffer, 68 Hunter (N. Y.) 341.
Com vs. Bowen, 140 Mass., 483.
Com. vs. Tobias, 141 Mass., 129.
Com. vs. Wetherbee, 153 Mass., 159.
Com. vs. Pflaum 50 Penna. Superior Ct. 55.
S. C. 236 Pa., 294.

A very good discussion of this question is to be found in
State vs. Campbell, 64 N. H. 402;
S. C. 13 Atl. 585; 10 Am. St. Rep. 419.
State vs. Newton, 45 N. J. L. 469.

See also:
State vs. Groves, 15 R. I. 208; 2 Atl. 384.
and the English cases,
Crofts vs. Taylor, 19 Q. B. D. 524.
Gage vs. Elsey, 10 Q. B. D. 518.

DECISIONS RELATIVE TO CONSTITUTIONALITY OF OUR SEVERAL FOOD LAWS.

1. Oleomargarine:

Act of 21 May, 1885, P. L. 22 is constitutional.
Powell vs. Com. 114 Pa. 265.
Powell vs. Pennsylvania, 127 U. S. 678.
Walker vs. Com. 11 Atl. 623.
Com vs. Shirley, 152 Pa. 170.

This Act was, however, declared unconstitutional by the United States Supreme Court in so far as it affects sale of oleomargarine imported into the State from another state or a foreign country and sold within the state in the original package.

Shollenberger vs. Pennsylvania, 171 U. S. 1.

See also
Collins vs. New Hampshire, 171 U. S. 30.

The decision in Shollenberger vs. Pennsylvania, however, does not overrule nor in any way invalidate the decision in Powell vs. Pennsylvania.

See:
Com. vs. Mellet, 27 Pa. Super. Ct. 41.

Act of May 23, 1893, P. L. relating to use of oleomargarine in charitable institutions is constitutional.
Com. vs. Webster, 13 Dist. Rep. 199.
Oleomargarine in charitable institutions,
13 Dist. Rep. 78.

Act of May 5, 1899, P. L. 241, is constitutional.
Com. vs. Van Dyke, 13 Pa. Super. Ct. 484.
Com. vs. McCann, 198 Pa. 509.
Com. vs. Diefenbacher, 14 Pa. Super. Ct. 264.

Act of May 29, 1901, P. L. 327 is constitutional.
Com. vs. McDermott, 37 Pa. Super. Ct. 1.
Com. vs. Caulfield, 211 Pa. 644.
Plumley vs. Mass., 155 U. S. 462.

As to constitutionality of injunction clauses of this Act, see
Com. vs. Andrews, 211 Pa. 644.
Com. vs. Henderson, 31 Pa. Super. Ct. 383.

2. Renovated Butter:
Act of 10 July, 1901, P. L. 643 is constitutional.
Com. vs. Seiter, 20 Pa. Super. Ct. 643.

3. General Food Laws:
(a) Act of 13 May, 1909, P. L. 520 is constitutional.
Com. vs. Pflaum, 50 Pa. Super. Ct. 55.
S. C. 236 Pa., 294.

(b) Act of 26 June, 1895, P. L. 317.

This Act was replaced and repealed by the Act of 1 June, 1907, P. L. 386, which in turn was replaced and repealed by the existing law, viz: the Act of 13 May, 1909, P. L. 520, but the decisions under these repealed statutes are important for the principles stated and the reasoning of the Courts.

The Act of June 26, 1895, was held constitutional in
Com. vs. Curry, 4 Pa. Super. Ct. 356.
and
Com. vs. Kevin, 202 Pa. 28, but in
Com. vs. Kebort, 212 Pa. 289, was declared unconstitutional so far as it related to liquors and other drinks, on account of defective title.

(c) Act of 1 June, 1907, P. L. 386.

Certain provisions of this act were declared unconstitutional in the cases of
Com. vs. Dougherty, 39 Pa. Super. Ct. 328.
and
Com. vs. Kephart, 39 Pa. Super. Ct. 524.

4. Constitutionality of Office of Dairy and Food Commissioner.
Com. ex rel vs. Warren, 217 Pa. 163.

5. The provisions of food laws and the practice of the agents of the Dairy and Food Commissioner in relation to the enforcement of food laws do not violate Art. 111, Sec. 27, of the state constitution in relation to inspection of merchandise.
Com. vs. Wilson, 9 Del. 357.

See also:
Com. vs. Arrow, 32 Pa. Super. Ct. 1.
Com. vs. Spencer, 28 Pa. Super. Ct. 301.
Com. ex rel vs. Warren, 217 Pa. 163.

Inspection involves necessarily the power of present condemnation of the articles inspected in so far as such articles do not conform to a given standard. Inspection operates upon things; our food laws operate upon persons. Dairy and Food Agents have no power under any of our laws to seize and condemn any article of merchandise. The remedy provided in these laws is by prosecution of the person offending; the law never proceeds against the thing which is adjudged illegal. In fact there is never a judicial condemnation of any article of merchandise. The judgment of the Courts is always against the person.

RULES OF CONSTRUCTION OF FOOD LAWS.

1. *All of the food laws contain penalties for violations of their provisions and are, therefore, what are commonly called penal statutes. But these laws, nevertheless, are entitled to a liberal construction, and not a strict construction.*

A "strict construction' is a close adherence to the liberal or textual interpretation, and a case is excluded from its operation unless the language of the statute clearly includes it.

36 Cyc. 1172-3.

Lagler vs. Bye, 42 Ind. App. 592.

A statute liberally construed may be extended to include cases clearly within the mischief to be remedied, unless such construction does violence to the language used.

36 Cyc. 1172-3.

Lagler vs. Bye, supra.

Kellar vs. James, 63 W. Va. 139.

Laws enacted for the protection of human life, for the prevention of fraud and the remedy of public evils are remedial and entitled to liberal construction.

36 Cyc. 1173 et seq.

A statute may be remedial and yet have penal provisions. In such case there is no impropriety in putting a literal construction on a penal clause, and a liberal construction on a remedial clause in the same Act.

Short vs. Hibbard, 2 Bing. 349.

Stull vs. Reber, 215 Pa. 156.

Com. vs. Shaleen, 215 Pa. 595.

Bechtel's Election, 39 Pa. Super. Ct. 302.

Com. vs. Kevin, 202 Pa. 23.

In the case of *Stull vs. Reber, Supra,* Chief Justice Mitchell in speaking of the Act of 18th June, 1895, P. L. 203, requiring the exclusion from the public schools of children who have not been vaccinated, says, (pg. 163):

"One expression in the opinion of the Court below, and in some of the cases cited in the argument, requires a passing note. The Act is not a penal statute. It is a broad general Act relating to the health of the whole population of the Commonwealth. It is not, therefore, to be construed or administered by the rigid technical rules applicable to penal laws, but fairly according to its intent, neither narrowing it to the letter, to the exclusion of cases clearly within such intent, nor stretching it beyond its legitimate scope to cover matters not clearly meant to be included. It is an Act touching very closely common rights and privileges and, therefore, specially requiring a common sense administration."

In *Com. vs. Kevin, 202 Pa. 23,* in constructing the General Food Act of 26 June, 1895, P. L. 317, Justice Mestrezat says, (pg. 27):

"The object of the statute is to protect the public health by securing pure food and to prevent fraud and deception in the manufacture and sale of adulterated articles of food. The purpose of the legislature in the passage of the Act is most commendable, and the statute should receive a construction by the Courts that will fully and effectively accomplish the object of its enactment."

2. *The several food laws make the sale, &c., of adulterated or misbranded foods an offense, and hence the intent of the offender is immaterial.*

In *Com. vs. Weiss, 139 Pa. 247,* in speaking of the Oleomargarine Act of May 21, 1885, P. L. 22, Justice Clark, delivering the opinion of the Supreme Court, says, pg. 250, et seq.:

"Guilty knowledge or guilty intent is, in general, an essential element in crimes at the common law, but statutes providing police regulations, in many cases make certain acts penal, where this element is wholly disregarded. The distinction is thus laid down in 3 Greenl. Ev. Sec. 21: 'The rule,' (i. e. that ignorance of fact will excuse) 'would seem to hold good in all cases where the act, if done knowingly, would be malum in se. But where a statute commands that an act be done or omitted, which in the absence of such statute, might have been done or omitted without culpability, ignorance of the fact or state of things contemplated by the statute it seems will not excuse its violation.' * * * * * Whether a criminal intent or a guilty knowledge, is a necessary ingredient of a statutory offence, therefore, is a matter of construction."

See also

Com. vs. Seiler, 20 Pa. Super. Ct. 260.
In re Carlson's License, 127 Pa. 330.
Com. vs. Zelt, 138 Pa. 626.
Com. vs. Sellers, 130 Pa. 32.
Com. vs. Holstein, 132 Pa. 351.
Wharton's Crim. Law, Sec. 87 & 88.

That the purchaser knew what he was buying and was not deceived, where the article sold was adulterated or misbranded will not excuse the defendant or avail as a defense.

Com. vs. Huffnal, 4 Pa. Super. Ct. 312.

The case of Com. vs. Huffnal was reversed on appeal to the Supreme Court, on another point, but the principle above stated was in effect affirmed.

Com. vs. Huffnal, 185 Pa. 381.

3. *If the ingredient added to a food is poisonous or injurious to health, it is not necessary that it should be added in such quantity or to such extent that the mixture or compound sold as food is rendered poisonous or injurious to health.*

Com. vs. Kevin, 202 Pa. 23.
S. C. 18, Pa. Super. Ct. 414.

The Kevin case was decided under the general food Act of 26th June, 1895, P. L. 317, since repealed, but the language of existing laws upon the same subject is the same as that in Act of 1895.

4. *Construction of Oleomargarine Act of 29 May, 1901, P. L. 327.*

The Act of 29th May, 1901, provides, inter alia: "That no person, firm or corporation shall, by himself, herself or themselves, or his, her or their agent, servant or employe, nor shall any officer, agent, servant or employe of any person, firm or corporation manufacture, sell, ship, consign, offer for sale, expose for sale or have in possession with intent to sell, oleomargarine, butterine or any similar substance * * * * * unless such person, firm or corporation shall have first obtained a license and paid a license fee as hereinafter provided; nor unless the said article, product or compound * * * * shall be made and kept free from all coloration or ingredients causing it to look like yellow butter," &c.

Under this provision of the law, in *Com. vs. Mellett, 27 Pa. Super. Ct. 41,* it was decided by the Superior Court, that upon an indictment for selling oleomargarine made or colored so as to resemble or be in imitation of yellow butter, a conviction may be sustained although there is no evidence of the artificial coloration of the oleomargarine by the addition thereto in the process of manufacture or afterwards, of any substance which had no other function than to cause it to resemble and be in imitation of yellow butter.

See also:

Com. vs. Caulfield, 27 Pa. Super. Ct. 279.

Under these decisions what is known as naturally colored oleomargarine was understood to be prohibited in Pennsylvania. But there remained some question as to what was meant by "yellow butter" in the Act, that olemargarine must not imitate or resemble. It was contended that oleomargarine could still be sold that was of a yellow tint or tinge, and did not resemble or imitate the deeper yellow shades of June butter.

But the meaning of the language of the Act prohibiting yellow oleomargarine has recently been settled by two decisions of our Superior Court, viz:

Com. vs. Clewell, 49 Pa. Sup. Ct. 389.

and

Com. vs. Ignatavig. 49 Pa. Sup. Ct. 397.

In the case of *Com. vs. Clewell*, Henderson, J., delivering the opinion of the Superior Court, Mar. 1, 1912, say:

"The defendant was convicted on an indictment charging him with selling oleomargarine which was not 'made and kept free from all coloration and ingredients causing it to look like yellow butter' in violation of the Act of May 29, 1901, P. L. 327. The question involved is thus stated: 'Whether the Act of Assembly of 1901, May 29, P. L. 327, Section 1, prohibiting the sale, manufacture, etc., of oleomargarine, which shall be in imitation of yellow butter produced from pure, unadulterated milk or cream of the same with or without coloring matter, means any shade or tint of yellow, and not what is commercially known as yellow butter. In other words, is yellow butter in the Act synonymous with any shade of butter yellow."

"In the argument of the appellant's counsel the statement is made that the only issue is, whether the oleomargarine sold by the defendant contained coloring matter or ingredients, causing it to look like yellow butter produced from pure, unadulterated milk, or cream of the same, with or without coloring matter. The position taken by the appellant is 'that the yellow butter named in the Act has reference to a certain standard of yellow butter which is the natural butter made in the month of June and which assumes a rich yellow color, but that natural butter made at any other time of the year falls below this standard of color.' It is also contended that butter made at other times in the year than the month of June is generally artificially colored to resemble butter made in the month of June and that, therefore, butter so colored becomes a standard of the yellow butter to which the Act of Assembly refers, and that the defendant should have been permitted to offer in evidence a sample of artificially colored butter for the purpose of showing that the oleomargarine, which he sold was not of that color. The issue thus presented is within narrow compass. The position of the defendant asks us to declare that when the legislature speaks of 'yellow butter' it means butter having the color of that product made in the month of June, but we are unable to find either in the words of the statute or from a consideration of the reasons leading to its enactment any warrant for such construction. As has been repeatedly stated the principal object of the Act was to prevent deception by dealers in oleomargarine, and it would be a remarkable inference that care was only exercised toward the safeguarding of the public against imposition as to butter made during one-twelfth of the year. Witnesses are not necessary to show that butter is not all of the same color whether made in the month of June or at any other time. Different shades of yellow appear in its production contingent on the breed of cows, the feed used, the time of year in which it is made and the process of manufacture, and when the phrase 'yellow butter' is used we think the legislature intended to describe the general color inhering in that product. Any other construction would open every market to the sale of oleomargarine made in imitation of butter and no prohibition would exist except as to the imitation of the highest natural color of butter or of butter colored, in imitation of it. This would defeat the very purpose of the Act."

See also:

Com. vs. McCann, 14 Pa. Super. Ct. 221.
Com. vs. Van Dyke, 13 Pa. Super. Ct. 484.

Serving oleomargarine with meals.

In Com. vs. Handley, 7 Pa. Super. Ct. 356, it is held that a public caterer who, for gain, furnishes oleomargarine as a part of a meal to his guests, is subject to the penalty provided by law.

In Com. vs. Miller, 131 Pa. 118, the Supreme Court construed the Act of May 21, 1885, P. L. 22, to apply to a restaurant-keeper furnishing oleomargarine to a customer as part of a meal.

5. *Construction of Act of May 23, 1893, P. L. 112, in relation to use of oleomargarine in charitable and penal institutions.*

Com. vs. Webster, 13 Dist. Rep. 199.
Oleomargarine in Charitable Institutions.
28 County Conrt Rep. 290.

6. *Construction of Food Laws relative to duty of Dairy and Food Commissioner as to enforcement.*

In re Pure Food Law Application,
11 Dist. Rep. 423.
Opinion by Elkin, Attorney General.

7. *Construction of second offence clause in Oleomargarine Act of 29 May, 1901, P. L. 327.*

Com. vs. McDermott, 37 Pa. Super. Ct. 1.
See also:
Com. vs. Neill, 16 Pa. Super. Ct. 210.

This latter case was, however, under the Act of 1889, and is not applicable to the present Act of 29 May, 1901.

EVIDENCE IN FOOD CASES.

While in food cases it is usual to offer in evidence a sample of the food alleged to be adulterated or misbranded, yet such course is not essential to conviction.

Com. vs. Caulfield, 27 Pa. Super. Ct. 279.

In some cases it is impossible to keep samples from time of purchase until time of trial because of the perishable nature of the commodity. This is true especially in the case of milk.

CONVICTION OF A PROPRIETOR ON PROOF OF SALE BY A SERVANT, AGENT OR EMPLOYE.

A master is responsible criminally for an illegal act of his agent, servant or employe, where such act is in the usual course of his employment.

Com. vs. Houston, 3 Dist. Rep. 686.
1 Wh. Crim. Law, Sec. 247.
Com. vs. Park, 1 Gray (Mass.) 553.
Com. vs. Nichols, 10 Metcalf, 259.
Com. vs. Morgan, 107 (Mass.) 199.
Com. vs. Boston R. R., 126 (Mass.) 61.
See:
Com. vs. Johnston, 2 Pa. Super. Ct. 317.
Zeigler vs. Com., 22 W. N. C. 111.
Com. vs. Junkin, 170 Pa. 202.
Com. vs. Willard, 9 W. N. C. 524.

Where the defendant is a corporation it is better to indict the active members of the corporation as individuals, but in such case the evidence must show some active participation by the defendant in the illegal act.

EVIDENCE OF SALE.

Sale is a word of precise legal import. It means at all times a contract between the parties to pass rights of property for money which the buyer pays or promises to pay to the seller for the thing bought or sold.

Williamson v. Berry, 8 How. (U. S.) 544.
Huthmacher vs. Harris' Admr., 38 Pa. 498.

The Elements of a Sale are:

1. Parties competent to contract.
2. Mutual assent.
3. A thing, the absolute or general property in which is transferred from the seller to the buyer.
4. A price in money paid or promised.

1 Benj. on Sales, Sec. 1.

As to what constitutes a Sale, see:

Com. vs. Leslie, 20 Pa. Super. Ct. 529, where it is held that a person may be convicted of selling oleomargarine unlawfully colored in imitation of butter, in violation of the Act of May 5, 1899, P. L. 241, where it appears that he solicited orders for the article and received pay for the same at the time the orders were given; that he sent the orders, together with the money to a manufacturer in another state; that the manufacturer packed the several parcels ordered in one crate or box and addressed and sent the same to the dealer as "agent," and that the latter distributed the parcels to the several persons who had ordered them. In such case it is immaterial that the dealer did not receive a commission from the manufacturer.

Where bottles or packages are fastened together and are marked or packed in a large box, barrel, crate or other receptacle, the outside box, bundle or receptacle and not any box or package contained therein constitutes the original package, and this is equally true although each bottle or package is separately wrapped in paper and labeled "original package," with the name of the importer.

In *Com. vs. Butterfield, 46 Pa. Super Ct. 380,* it was decided that on the trial of an indictment for selling oleomargarine without a license a conviction will be sustained where the evidence shows that the defendant took orders in the place where he resided, from various parties for oleomargarine, in quantities varying from five to ten pounds, to each individual; that he sent these orders to a dealer in another state; that the dealer put up the orders in separate packages writing the names of the respective purchasers on the packages; that the packages were placed in wooden boxes, shipped to the defendant who delivered them to the different purchasers; that the defendant paid the dealer twenty cents a pound for the oleomargarine, and received from his customers twenty-two cents a pound, and that the difference was used for freight and charges, and this was known to the customers.

In *Com. vs. Paul, 170 Pa. 284*, the Supreme Court discusses the question of what constitutes an "original package" within the meaning of the commerce clause of the federal constitution.

See also:

Com. vs. Schollenberger, 156 Pa. 201.

EVIDENCE OF GOOD CHARACTER IS NOT ADMISSIBLE IN A FOOD CASE.

The reason for this rule is that the food laws do not imply any criminal intent. The laws make the sale of an adulterated or misbranded article of food an offence, whether the defendant knew the article to be adulterated or misbranded or not.

Com. vs. Weiss, 139 Pa. 247.

Hence the rule, (allowing defendant to introduce character witnesses) has little or no application to such laws. They are penal acts which have no moral quality, but are *mala prohibita.*

Com. vs. Nagle, 157 Mass. 554.
16 Cyc. 1284, note 98.
Com. vs. Kolb, 13 Pa. Super Ct., 347.

In introducing proof of character, regard must be had to the nature of the offence charged against the party, and inquiry ought to be made as to the reputation of the individual for habit of life or mode of thought, feeling or action inconsistent with his alleged guilt or innocence.

Com. vs. Irvin, 1 Clark, (2 Pa. L. J.) 329.

PLEADING AND PRACTICE.

1. *Indictment.*

"Every indictment shall be deemed sufficient and good in law which charges the crime substantially in the language of the Act of Assembly prohibiting the crime and prescribing the punishment, if there be any such, or if at common law, so plainly that the nature of the offense charged may be easily understood."

11th Sec. of Crim. Procedure Act. of 1860.

Criminal proceeding is no longer the technical thing it was. The Courts now look more to substantial justice than to artificial nicety.

Com. vs. Keenan, 67 Pa. 203.
Com. vs. Wood, 2 Pa. Super. Ct. 42.
Com. vs. New Bethlehem, 15 Pa. Super. Ct. 158.
Staeger vs. Com., 103 Pa. 469.

(a) *Suggestions as to indictment.*

State the offence as nearly as possible in the language of the Act of Assembly.

Avoid the use of the disjunctive "or" in describing the offense. Substitute "and;" although an indictment will not always be quashed because of the use of "or."

See:

Com. vs. McDermott, 37 Pa. Super. Ct. 1.

Avoid the use of the word "wilfully" or "knowingly" in all food indictments. It is sufficient to state that the defendant did unlawfully, &c. By using the word wilfully you render it impossible to convict unless the Commonwealth proves guilty knowledge or intent.

(b) *Motions to Quash.*

In the absence of a statute, defects in the information or complaint upon which the committing magistrate acted, are not, after indictment found, ground for a motion to quash where the information charges an offence.

Com. vs. Brennan, 193 Pa. 567.
Com. vs. Dingman, 26 Pa. Super. Ct. 615.
22 Cyc 418 and note 68.

(c) *Duplicity in Indictment.*

Where a statute makes two or more distinct Acts connected with the same transaction indictable, each one of which may be considered as representing a phase of the same offence, it is not regarded as duplicity to join the same in one count.

Wharton's Crim. Plead., 257.
Com. vs. Miller, 107 Pa., 276.
Com. vs. Mentzer, 162 Pa., 646.
Com. vs. Kolb, 13 Pa. Super. Ct., 347.
Com. vs. Sober, 15 Pa., Super. Ct., 520.

Jillard vs. Com., 26 Pa., 169.
Com. vs. Schoenhutt, 3 Phila., 20.

Thus, it may be charged that a defendant offered for sale, exposed for sale, had in his possession with intent to sell and sold, in the same count of the indictment.

(d) *Bills of Particulars.*

A bill of particulars is not a matter of right, but is addressed to the discretion of the Court, and will be allowed only to prevent injustice and surprise.

Com. vs. Buccieri, 153 Pa., 535.
Com. vs. Powell, 23 Pa., Super. Ct., 370.

A bill of particulars will never be required to compel the Commonwealth to disclose the evidence of the crime charged in the indictment.

Com. vs. Buccieri, supra.
Com. vs. Lovegrove, 10 York, 159.

In *Com. vs. Applegate, 1 Dist. Rep. 127*, the Court refused a rule for the residences of the witnesses for the Commonwealth endorsed on the indictment.

(e) *The Court will not require the Commonwealth to deliver over to the defendant a portion of the sample which is the basis of the prosecution.*

See opinion of Bell, J., in Quarter Sessions of Blair Co. in Com. vs. Koller, et al., as follows:

"So far as the rule for a bill of particulars is concerned, as ruled by the Supreme Court in Commonwealth vs. Powell, 23 Super. Ct. 372, a bill of particulars in a criminal case is not a matter of right, but is only an appeal to the sound discretion of the Court. My recollection is that in some of the pure food indictments in cases tried in this Court there was simply an allegation in the indictment that the pure food act had been violated, without specifying the particular violation. I am inclined to think that that indictment was perfectly good. We have our Act of Assembly which provides that an indictment shall be deemed sufficient which simply follows the words of the Act of Assembly, and if this indictment had simply followed the words of the Act of Assembly, and been in the general form with which we found other indictments, we would feel it but right and proper that the Commonwealth should specify the particular article of food which was supposed to be adulterated, and at least specify in a general way how that particular article of food was adulterated; but in the present instance the particular article of food is specified, to wit, chocolate, and there is a general statement as to how it is adulterated.

I think we will all agree on a moments's reflection that the rulings of the appellate courts on this subject are perfectly right and proper. The authority cited by Mr. Baldridge is not analagous authority at all. In the first place, as stated by Mr. Woodward, the physical examination to which the plaintiff is compelled to subject himself is always made—and I am speaking only as to the orders of—is always in the presence of the physician of the plaintiff. I have drawn frequent orders compelling plaintiffs in damage cases to submit to physical examinations, but I was always careful to provide that the physician of the plaintiff should be present so that no unfair advantage could be taken of the plaintiff, and that everything that was done there was done in the presence of the physician of the plaintiff But, it seems to me that the endeavor to liken a civil proceeding to a criminal proceeding is fallacious, and that is the vice of the offer. In a civil proceeding the plaintiff may be compelled to subject himself to a physical examination. At the same time, he has the mutual and co-ordinate right of compelling defendant to disclose his case. Not so in a criminal case. The defendant can hold all the papers in his possession, and there is no power to compel him to produce them. He can sit on the witness stand and say, 'I have a paper at home,' and the Court is powerless to make him produce evidence to establish his guilt. That is one reason. In the second place a civil suit is tried on the weight of the evidence. Each party comes in with an equal right to be heard as to the measure of proof, but in a criminal suit the burden is on the Commonwealth to establish the case beyond a reasonable doubt, and these maxims of ours about the reasonable doubt that the jury must come to the firm, unwavering conviction that the defendant is guilty, have come to us from times when judges were won't to hang a man for stealing a loaf of bread. Now I do not say in the present criminal procedure that we should get away from those old maxims, but I do say that while we adhere to those old maxims, (which we adopted when they hung men for stealing a loaf of bread), such maxims ought not to be applied against the Commonwealth on the one side, and then, on the other hand, the Commonwealth be compelled to disclose all their case; and the absence of precedent to my mind is strong proof that there is no warrant for a Court compelling the Commonwealth to submit their evidence in advance to the defendant.

It does seem to me that the able criminal lawyers who have defended criminals charged with grave offenses, if there was any warrant for such a precedent, would have brought it in force. Take for instance a murder case. The Commonwealth claims that they found on the prisoner a bloody shirt, and that the blood stains are human blood, not chicken blood, or blood which he received butchering a hog, but human blood; now we all know that the experts on the part of the defense coach the lawyers for the defense while they cross-examine the experts of the Commonwealth, but I do not think there would be any warrant for a defendant charged with murder to say 'you must tear that shirt in two, and you must give my chemist one-half of the alleged blood stains so that they can prepare a defense;' or, to put it more mildly, that they can have the alleged blood stains analyzed. I do not know of any such precedent, and the very fact that Mr. Baldridge, after diligent search, has been unable to find one, to my mind is proof that there is no warrant to force the Commonwealth to produce the evidence they are going to submit. As I said before, in a civil suit, under certain equitable rules, each side must apprise the other side of what evidence they are going to use, but I do not think it would be fair to say to the Commonwealth, you must give the defendant all your side of the case so that he can examine and ransack it, and at the same time allow the defendant to keep his mouth shut. It seems to me that would be giving the defendant an unfair advantage, and it seems to me it would be unfair to compel the Commonwealth to allow a defendant to subject their samples to examination in advance, and I will overrule the application for the compelling of the production of such samples.

As to experiments in open Court, I do not know to what extent I will go about a matter of that kind. I did rule in the formaldehyde cases, where Mr. Hicks wanted to take a drink of the preservative, and wanted the Court to take a drink of it, and let the jury take a drink of it, I did rule that he could take a drink, but the Court would not, and would not have the jury do so. Mr. Hicks was going to turn the Court into a laboratory, and I think we said we would not have any laboratory here in Court. I do not know to what extent I would go if there was any effort on the part of the defendant to examine samples by microscopic tests—I will leave that matter open."

2. *Sentence.*

Most of the food laws fix a maximum and minimum penalty for their violation.

The construction placed upon these clauses of the several acts by the department and by most of the Courts of the state is that in thus fixing a maximum and minimum sentence, the legislature took away from the Court the discretion to suspend sentence. It will be observed in this connection, that as a general rule the legislature in penal Acts fixes no minimum, hence the Court may suspend punishment entirely,—but in these police regulations wherein a minimum sentence is fixed, the Court must conform to the Act and inflict at least the minimum penalty.

Selling, offering for sale, having in possession with intent to sell and exposing for sale, where these occur as a part of a single transaction, are not separate offences for which penalties can be multiplied. The sale in such cases embraces all that has gone before and leads up to it, as necessary incidents and constitutes but one complete offence.

Com. vs. Roberts, 125 Pa., 174.

RULES AND REGULATIONS FOR THE ENFORCEMENT OF THE PROVISIONS OF THE FOOD ACT OF PENNSYLVANIA, APPROVED THE 13TH DAY OF MAY, A. D. 1909.

Harrisburg, Pa., June 15, 1909.

As required by Section 8 of the Food Act of Pennsylvania, approved the 13th day of May, A. D. 1909, the Dairy and Food Commissioner, charged with the enforcement of the provisions of said Act, has made the following rules and regulations for the enforcement thereof. These rules, where possible, conform to and are the same as the rules and regulations adopted for the enforcement of the Act of Congress, approved June 30, 1906, commonly known as the "Food and Drugs Act."

RULE NO. 1, SAUSAGE. Sausage or sausage meat shall be held to be a comminuted meat from neat cattle or swine, or a mixture of such meats, either fresh, salted, pickled or smoked, with added salt and spices and with or without the addition of edible animal fats, blood and sugar, or subsequent smoking. It shall contain no larger amount of water than the meats from which it is prepared, contain when in their fresh condition, and if it bears a name descriptive of kind, composition, or origin, it must correspond to such descriptive name. All animal tissues used as containers, such as casing, stomachs, etc., must be clean and sound and impart to the contents no other substance than salt. All sausage found to contain any cereal, or added water, or other substance, except as herein stated, shall be deemed to be adulterated.

RULE NO. 2, FRUIT PRESERVES, JAMS AND JELLIES. All fruit preserves, jams and jellies shall be true to name and contain nothing but the fruit after which they are called, together with sugar, except, that fruit butters may contain spices and vinegar. Where glucose is used as a substitute for sugar, either in whole or in part, for the purpose of sweetening or cheapening an article of food, the substance should be marked to show the presence of glucose, such as glucose jelly, glucose jam, glucose fruit butter, together with the name of the fruit which gives it the flavor, in accordance with the provisions of the Act relating to branding.

RULE NO. 3, POWDERING AND COATING. The term "powdered," as used in the Fourth Clause of Section 3 of the Act, shall be held to mean the application of any powdered substance to the exterior portion of articles of food.

The term "coated," as used in the same clause, shall mean the application of any substance to the exterior portion of food product.

RULE NO. 4, COATING OF RICE. No coating of any kind may be used for rice, where the same is used to conceal damage or inferiority, or to make the rice appear of better or greater value than it is. In each case, whether or not such a result be secured, is a question of fact to be decided by the evidence.

RULE NO 5, COLORS. The use of any dye, harmless or otherwise, to color or stain a food in a manner whereby damage or inferiority is concealed, or whereby the food is made to appear of better or greater value than it is, is specifically prohibited by law. The use in food for any purpose of any mineral dye, or any coal tar dyes not hereinafter listed, will be grounds for prosecution. Until further notice the coal tar dyes hereinafter named, made specifically for use in foods, and which bear a guaranty from the manufacturer that they are free from subsidiary products and represent the actual substance the name of which they bear, may be used in foods. The following coal tar dye which may be used in this manner are given numbers, the numbers preceding the names referring to the number of the dye in question as listed in A. G. Green's edition of the Schultz-Julius Systematic Survey of the Organic Coloring Matters, published in 1904.

The list is as follows:

RED SHADES:
107. Amaranth.
56. Ponceau 3 R.
517. Erythrosin.
ORANGE SHADE:
85. Orange 1.
YELLOW SHADE:
4. Napthol yellow S.
GREEN SHADE:
435. Light green S. F. yellowish.
BLUE SHADE:
692. Indigo disulfoacid.

Each of these colors shall be free from any coloring matter other than the one specified, and shall not contain any contamination due to imperfect or incomplete manufacture. (F. I. D. 76.)

RULE NO. 6, SODIUM BENZOATE AND SULPHUR-DIOXIDE. Under the fourth proviso of the Fifth Clause of Section 3, the following articles of food are designated as those articles of food in which benzoate of soda, or benzoic acid, have heretofore been generally used, to wit:

Catsup, mince-meat, sweet chow-chow, sweet pickles, preserves, jams, jellies, fruit-butters, shredded and dried cod-fish and cider, when used as a food ingredient.

For the purpose of this Act, one-tenth of one per centum of benzoate of soda, or benzoic acid equivalent thereto, may be used in the foods above enumerated, provided, the fact that sodium benzoate has been used in the preparation of such foods shall be plainly stated on each package thereof.

The use of sodium benzoate is not permissible in any other article of food, except those hereinabove designated.

The word "package," as used in the Fourth Proviso of the Fifth Clause of Section 3 of the Act, shall include all containers, whether supplied by the dealer or by the consumer.

RULE NO. 7, SODIUM BENZOATE AND SULPHUR-DIOXIDE, continued. When any quantity of sodium benzoate or sulphur-dioxide has been used in the preparation of a food, that fact shall be plainly stated on each package, and the Act also provides, under the Fourth Clause of Section 4, relating to misbranding, that the labeling of packages required by this Act shall be on the main label of each package, and in type not less than 8-POINT BREVIER CAPS in size, unless the size of the package will not permit the use of 8-POINT CAP type, in which case the size of the type may be reduced proportionately and in such position and terms as may be plainly seen and read by the purchaser.

Under these separate clauses the presence of sodium benzoate or sulphur-dioxide will be held to be plainly stated on each package of food when the fact of such presence is stated in such a way as that it may be plainly seen and read by the purchaser, in colors contrasting with ground on which it is placed and in character of type and position upon the container in conformity with the provisions of the Act.

RULE NO. 8, MEATS, PRESERVES AND SIMILAR FOOD SUBSTANCES THAT ARE LIKELY TO BE CONTAMINATED BY EXPOSURE TO FLIES AND OTHER INSECTS, OR EXPOSED TO THE DUST OF THE STREET OR THE STORE. Under the provisions of the Sixth Clause of Section 3 of the Act, an article of food is adulterated where the same is an animal or vegetable substance produced, stored, transported, or kept in a way or manner that would render the article diseased, contaminated or unwholesome. Under this Clause of the Act, meats, preserves and similar food substances that are likely to be contaminated by exposure to flies and other insects, or exposed to the dust of the street, or store will be required to be kept screened so as to prevent all contamination.

RULE NO 9, GUARANTY. The guaranty referred to in the Food Act of Pennsylvania, approved the 13th day of May, A. D. 1909, shall in all cases be a written or printed invoice guaranty, bearing the date of said invoice, upon each bill of goods purchased, signed by the vendor, and substantially in the following language, to wit.

> I (or we) the vendor of the articles mentioned in the foregoing invoice, hereby guarantee and warrant the same to be in full conformity with the Act of the General Assembly of Pennsylvania, known as the "NEW FOOD LAWS," approved the 13th day of May, 1909, in that the said articles are not adulterated or misbranded within the meaning of the aforesaid Act.
>
> (Signature)........................

RULE NO. 10, LABELS. Numerous requests are referred to this Bureau for the approval of labels to be used in connection with food products under the Food Act of Pennsylvania, approved the 13th day of May, A. D. 1909. This Act does not authorize the Dairy and Food Commissioner, nor any agent of the Bureau, to approve labels. The Bureau, therefore, will not give its approval to any label. Any printed matter upon the label implying that this Bureau has approved it will be without warrant. It is believed that with the law and regulations before the manufacturers, they will have no difficulty in arranging labels in conformity with the requirements set forth.

RULES Nos. 11, 12, 13 and 14.

Issued July 8, 1909.

RULE NO. 11, PREPARED MUSTARD. The names, prepared mustard, German mustard, French mustard, mustard paste, shall be used only to designate pastes composed of a mixture of ground mustard seed, or mustard flour, with salt, spices and vinegar, and calculated free from water, fat and salt, shall contain not more than twenty-four (24) per centum of carbohydrates, calculated as starch, determined according to the official methods, not more than twelve (12) per centum of crude fibre, nor less than thirty-five (35) per centum of protein, derived solely from the material named.

RULES NO. 12, FLAVORING EXTRACTS. The names, flavoring extract, flavor, flavoring, essence and tincture, as applied to articles intended for use in the preparation of foods, shall be used only to designate solutions in ethyl alcohol of proper strength of the sapid and odorous principles derived from aromatic plant, or parts of the plant, with or without its coloring matter, and shall conform in specific name to the plant used in its preparation.

Flavoring solutions, in the preparation of which flavoring substances not derived from the plant specifically named have been added, shall not be designated as if prepared solely from the aromatic plant named.

An imitation flavoring extract shall not be given a name nor bear upon its label any statement, design or device that shall in any way indicate that it is the flavoring extract which it imitates.

RULE NO. 13, MARASCHINO CHERRIES. Maraschino cherries must not contain sulphurous acid, sulphur dioxide, sulphites, salicylic acid, or other preservative prohibited by law, nor any other ingredient deleterious to health, and if artificially colored, such coloring must be effected solely by the use of harmless animal or vegetable colors, or of the coal tar dyes named in Rule 5, and when so colored the fact shall be plainly declared on the label.

Subject: REVISION OF RULE NO. 14.

PENNSYLVANIA DEPARTMENT OF AGRICULTURE.

Dairy and Food Bureau.

Rule NO. 14, REVISED.

Issued May 5, 1911.

RULE NO. 14, REVISED, CONFECTIONERY AND CHOCOLATE. Mineral substances of all kinds, whether poisonous or not, are forbidden in confectionery. The addition of any alcoholic liquor to confectionery is prohibited, and no alcohol may be added to it except as the alcohol occurs in the customary alcoholic tinctures or extracts used for flavoring purposes, or as a solvent for glazes.

The use of resinous glazes on chocolate and confectionery is not permitted for the reason that resins have no nutritive or dietetic value, but are known as the characteristic solid ingredients of varnishes, and that their introduction into foods would be repugnant to and not tolerated by the consumer if he were aware of the fact—so that their use in food would violate Clause 1, Section 3, Act of May 13, 1909, in that it would injuriously affect the quality and purity of the product concerned; also for the further reason that the resins, not being primarily intended for use in foods, are not gathered and handled in such manner as to fit them sanitarily for such use, and even, in the case of shellac particularly, are frequently admixed with poisonous or deleterious substances, such as sulphide of arsenic and litharge, so that their use would violate the spirit of Clause 6, and often of Clause 5, Section 3, of the Act above mentioned. This regulation, in its effect, is in harmony with Food Inspection Decision No. 119, under the National Food and Drugs Act, June 30th, 1906.

Subject: RULE NO. 15, OYSTERS.

PENNSYLVANIA DEPARTMENT OF AGRICULTURE.

Dairy and Food Bureau.

RULE NO. 15.

Issued January 12, 1911.

RULE NO. 15, OYSTERS. Oysters and other shell-fish whose water content has been increased, whether by 'floating' or 'drinking' in fresh water or salt water of less density than that in which they have been grown, by the addition of ice or water, or in any other manner, will be deemed adulterated.

The new Food Act of Pennsylvania, approved the 13th day of May, A. D. 1909, protects innocent retail dealers when its provisions are complied with. In order to avail themselves of this protection, it is important that every retail dealer secure from the manufacturer, wholesaler or jobber from whom he makes purchases, a signed guarantee of each invoice of goods. In order that the goods may be subsequently identified, it is important that the date of purchase be marked upon the goods secured under each invoice. Where the goods are contained in separate packages, this identification can readily be secured by the use of a rubber stamp giving the date of purchase. Unless the retail dealer is able to identify with absolute certainty the vendor from whom his goods were procured, the Act will not protect him. This will require the greatest care, not only in marking the date of purchase, but in keeping the articles purchased from different manufacturers, wholesalers or jobbers bearing the same brand, entirely apart from each other, so that at any time the identification of the vendor of each article can be clearly established. It is equally important that the retail dealer shall keep the articles purchased in precisely the same condition as when they are received. a failure to distinctly identify the vendor, or to clearly prove that articles purchased have been kept in the exact condition as to quality as when purchased, will deprive the retail dealer of any protection.

When an agent of the Dairy and Food Bureau calls upon a retail dealer, it is requested and confidently expected that courtesy will be exercised both by the dealer and the agent.

JAMES FOUST,
Dairy and Food Commissioner.

OLEOMARGARINE AND RENOVATED BUTTER LICENSES.

1. No license will be granted to a non-resident of the State of Pennsylvania.

2. No license will be transferred from any person, firm or corporation convicted of any violation of the Acts of Assembly under which such license is issued, nor while proceedings are pending for violation of said Acts against such person, firm or corporation.

3. When a license has been issued to a certain address, a second license will not be issued to the same address for the same year or fractional part thereof.

4. No license certificate permits the sale of oleomargarine from wagons, or from any other place except that designated in said license certificate.

5. Remittance (either Bank Draft, Cashier's Cheque, or Certificate of Deposit, preferred), for license fees must accompany the application for license. Individual cheques must be certified by the bank on which same are issued or drawn. Cheques and drafts must be made payable to the order of the State Treasurer, and upon receipt thereof by the DAIRY AND FOOD COMMISSIONER, if the application is approved, a license certificate will be promptly issued.

6. The attention of intending applicants for license and of all licensees, is especially directed to that portion of Section 7 of the Act of 29th of May, 1901, which provides: "that upon conviction of any subsequent offense, the person so offending shall be punished by a fine of not less than five hundred dollars, nor more than one thousand dollars, and by imprisonment in the county jail for not less than six months nor more than twelve months."

The express direction of said Act is imprisonment in addition to the minimum fine therein specified.

In addition to the fine and imprisonment imposed for second offenses, injunction proceedings will be instituted, and no license will be transferred from any person against whom such proceedings are pending.

The Dairy and Food Commissioner will supply applicants with the proper printed blank forms which must be used by all applicants for oleomargarine and renovated butter license certificates. These forms furnish detailed information as to license fees, etc. They also show the respective periods of time for which licenses are issued. A certificate issued with the beginning of the year must include payment for the entire year, while those issued at a later period must include payment for the part of the year remaining, always dating from the first day of the month in which the application was filed.

SCHEDULE OF LICENSE FEES.

The following tabulated statement shows the respective amounts due the Commonwealth for the various lincenses named, for the entire year, or fractional parts thereof, and checks, or drafts must be sent for the correct amount.

Kind of License.	Cost of License.											
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Manufacturer's license,	$1,000	$916 67	$833 34	$750 00	$666 67	$583 34	$500 00	$416 67	$333 34	$250 00	$166 67	$83 34
Wholesale license,	500	458 34	416 67	375 00	333 34	290 67	250 00	208 34	166 67	125 00	83 34	41 67
Retail license,	100	91 67	83 34	75 00	66 67	58 34	50 00	41 67	33 34	25 00	16 67	8 33
Hotel or restaurant license,	50	45 84	41 67	37 50	33 34	29 18	25 00	20 84	16 67	12 50	8 34	4 17
Boarding house license,	10	9 16	8 33	7 50	6 66	5 83	5 00	4 16	3 33	2 50	1 66	83

If the application is signed by a firm name, kindly supply full names of partners constituting the firm; when signed by a company give name of president, secretary and general manager.

Sign names in full—for example: "John Jacob Doe," NOT "J. J. Doe."

It is also imperative that you give the number of the building in which your place of business is located and the street upon which it is situated. If it does not have a number, give the name by which it is known, or describe its location as nearly as possible by some well-known landmark, in order that it may be definitely located.

This information is essential in order to secure a license certificate, and failure to furnish the same will mean indefinite delay in the issuing of said license certificate.

Two signs which will be supplied by the Dairy and Food Division, must be hung up in conspicuous places on the walls of the room or store in which oleomargarine is sold. Each package must be plainly marked "Oleomargarine," as the law directs, and oleomargarine or butterine must be "free from coloration or ingredients that cause it to look like butter."

Commonwealth of Pennsylvania

DEPARTMENT OF AGRICULTURE

BULLETIN No. 233

Practical Side of Local Organization in Agriculture

PAPER READ BY J. ALDUS HERR OF LANCASTER COUNTY BEFORE
THE ANNUAL MEETING OF THE PENNSYLVANIA STATE
BOARD OF AGRICULTURE, JANUARY 24, 1912

PUBLISHED BY DIRECTION OF THE SECRETARY OF AGRICULTURE

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1912.

PREFACE

Commonwealth of Pennsylvania,
Department of Agriculture,
Harrisburg, Pa., March 25, 1912.

A very practical paper on the subject of Local Organization in Agriculture was read before the meeting of the Pennsylvania State Board of Agriculture, at its annual session held at Harrisburg, January 24 and 25, 1912. The subject matter of the paper was regarded by the Board as being of so much importance to the agricultural interests of the State as to induce the passage of a resolution requesting its publication as a bulletin of the Department of Agriculture. Being in full accord with this view, its publication is authorized, together with the full text of the constitution and by-laws of the "Lancaster County Farmer's Association," which is organized and is now successfully operating along the lines suggested in Mr. Herr's paper.

Since the passage of the resolution referred to, it came to the knowledge of the Secretary of Agriculture that a like Association has been organized and is now in successful operation in York county, and considering the matter of sufficient importance to the agriculture of the State to warrant the publication of all the information available upon the subject, Prof. Franklin Menges, who is the author of the Articles of Association under which the York county farmers are operating, was asked to furnish a copy of these articles for publication with and as a part of this bulletin.

Believing that no further comment is needed to enable the farmers of the State to see the importance of local organization, this bulletin is sent out in the hope that it may not only give encouragement in this direction, but also prove helpful in effecting such local organization wherever the need is felt.

N. B. CRITCHFIELD,
Secretary of Agriculture.

THE PRACTICAL SIDE OF LOCAL ORGANIZATION IN AGRICULTURE

By **J. ALDUS HERR,** *Lancaster, Pa.*

Read at the Annual Meeting of the Pennsylvania State Board of Agriculture, at Harrisburg, January 24, 1912.

This much talked of topic has received more attention the last year than at any previous time, and in many instances has resulted in much good to the producer as well as the consumer.

Organizations are of early origin, but most of these pertaining to the uplifting of farm life have chiefly been along the social side, and the practical part has partially been neglected. Organizations of this kind are designed to further their interests and particularly bring the producer and consumer, the farmer and manufacturer into direct commercial relations without the intervention of the middlemen.

Nearly all industries have established organizations for the betterment of their interests, even in the conservative County of Lancaster. We have two agricultural clubs that have been in existence for many years: namely, the "Octoraro Farmers" and the "Fulton Farm Club." I have read the report of these meetings when the writer was a mere boy. Then came the Lancaster County Agricultural Society, this was followed by the Grange, and more than a half dozen similar organizations pertaining to farm life, all doing work along their respective lines. But their advancement has been chiefly social instead of dealing with the more practical side of their occupation.

The question which confronts most of us is, How can we combine the two with better advantage to the majority of persons interested?

The two chief interests confronting the farmer today are more economical production, and better distribution of marketing.

Too many of the crops on the farm are produced at an actual loss, or probably just sufficient profit to maintain the industry. Following this is the finding of the best markets for the products, too often there are instances where some markets are glutted at the expense of other poorly furnished ones.

These are the two chief interests that have been neglected in most farm organizations, except a few large companies who have tried to solve the problem with some degree of success, but often being too large, and beyond the control of the producer and consumer alike.

The State and National Grange have done much good in general, but in our county it has been a dismal failure, a few persons knowing there is one in existence. About twenty years ago there was a local Grange in our community, but it long since has gone the way of many other good organizations for want of actual effort. The social side was a glowing success, but the business and financial part was sadly neglected, thus the result mentioned.

Now how best to overcome these serious failures is the question to solve. The very nature of the farmers' calling should induce him to organize locally for the purpose of selling the crops he produces, and buying the articles he must have in his business, and to learn to deal more direct with the consumer and producer; thus to eliminate to a certain extent the middlemen who have been a very costly adjunct in the business life of the American Farmer.

The farmer of the future must be more of a reader and thinker for his own benefit. The more direct he deals with the consumer and producer the more intelligence he must put in his business.

After having produced a valuable crop, it requires some business and executive ability to put his products before the purchaser in the most attractive appearance with a profit to himself, as well as a reasonable price to the consumer. Not forgetting the fact that a pleased and satisfied customer is the best "ad" in any line of business and much cheaper, and more durable than printers' ink. The time has never existed when there was an over-production of a good, first-class article, if properly distributed, and goods of this class always demand a paying price, and in many instances the purchaser will look up the producer who has goods of this class for sale.

We as farmers should think more of the consumers' wants and desires, who are willing to pay good value for goods received, if in so doing they actually receive full value for what they pay. We should take a full broad view of the business relations between the producer and consumer.

The more familiar the farmer is with the life of the consumer and *vice versa*, the more satisfactory it will be for all concerned. Invite the consumer to come and see the plant where the articles offered for sale are produced, by so doing you would receive the confidence and advertising medium of a good customer, which is a long step in the line of success.

The origin of all Government is the home. The basis of all large organizations must be of local origin; no wheel is stronger than the weakest cog within its circle.

The foundation for a business organization must be laid by the members within reasonable bounds of their local community.

No one is more capable of knowing the wants and desires of a community than the residents thereof, and they should be more efficient in the management of said local organization. Whenever a company expands beyond a certain limit it becomes unwieldy and throws itself liable to many dangers which are detrimental to the control and a menace to the best development along the line of business intended. Self-government, which begins at home, is also appreciable in local organizations, and in a very great degree, means nothing more than good common sense, which is frequently lacking in many business propositions.

The country at large today is more aroused about the organization of the farmer than it has ever been before. Most dailies, and many of the most prominent magazines give considerable space to the discussion of this most worthy subject.

The place to foster this worthy child of the "Farm Organization" I believe must be in the public schools. The child who will make the successful farmer of the future must be better equipped to deal with the problems that will confront him. He must see farm life from a higher and different aspect than he has ever seen it before. The day is at hand when the manual training system of education must be the prevailing school established for the rural as well as the city districts.

The ever pressing demand for education that will train the child to be a self-sustaining bread winner, will be the power; and when started right, it will control the best interests in the United States. Then, and not till then, will the farmer receive his just demands, and the now dominating powers will give recognition when asked for, or be trodden on by the onward move of justice.

As far as farm organization has gone, it is a step in advance of education. The rural schools as well as those of the city should become a unit of power in the betterment for agricultural uplift, for the destiny of both classes is dependent upon the success of agriculture.

All other industries are at the mercy of the great calling, tilling the soil. The issue of the day is better government for local organizations. Local farm organizations have been started in many places and have proven beneficial; with few exceptions the farmer has not received his portion of the dollar in the disposal of his products, and yet these organizations have more efficient buyers than sellers. The most direct road to dispense with the middlemen's profit is through more direct buying from the manufacturers, this end of the problem has been fairly well solved.

The Lancaster County Farmers' Association which we started five years ago, was of very humble origin, the first season ending in 1911. They did a business of $122,000.00, paid 5% on the capital stock and conducted the business on a 2½% basis. They have capitalized at $75,000.00 and have 1,000 members in good standing.

A very important feature of this organization is that all business is done on a cash basis. It is the duty of the General Manager to receive prices on all lines of goods to be purchased. If any member refuses to pay cash, he is denied the privileges of the association and cannot deal with it.

This organization has a main office, with four branches, its 1,000 members ordering all goods through the General Manager; but each branch is responsible for its own indebtedness and should any of the branches fail it cannot in any way affect any of the other branches.

At present two of the branches have built substantial brick buildings for stores, costing about $4,000 each, the two branches carrying about $18,000.00 worth of goods needed on the farm, coal, feed, flour, seeds, oils, implements and farm machinery in general. You can buy nearly everything needed on the farm from a tack to a four-horse wagon. As mentioned before the way to eliminate the middlemen is by direct selling to the consumer. If the members of an organization, like the one in Lancaster county, would unite in disposing of their crops in carloads, having some responsible man to whom to ship to regularly, it certainly would be of immense benefit to the producer.

The thousand members could create a demand for first-class products, and to a great extent, solve the problem of dividing the dollar between the producer and consumer, without the assistance of the much talked of middlemen.

But in selling direct as well as purchasing there are many problems of importance to be met, and right here is where the public schools are deficient in not giving the pupils an education on a more substantial bread-winning basis. Had the new school code of Pennsylvania given us this much needed training for the men and women of the future, we might excuse the remainder of that voluminous document.

In direct selling, there must be a confidence established between the seller and purchaser, of the highest standing; and great care should be taken that this confidence should never be misplaced.

Oh! hail the day, for it is near at hand, when the onward movement of Local Farm Organization will be heard all along the land, and the elements of resistance that are defying our advance, will listen and take warning, when many of the shackles will be cast asunder.

Then, and not till then, will the farmer receive to a large degree the profits of his toil.

BY-LAWS OF THE LANCASTER COUNTY FARMER'S ASSOCIATION

NAME

Art. I. The name of this Association shall be, and is, The Lancaster County Farmers' Association, Incorporated.

OBJECT

Art. II. The object of the Association is to protect farmers' interests and improve their condition in general, especially in buying and selling supplies, and the products of the farm.

MEMBERSHIP

Art. III. Any law-abiding citizen, being in sympathy with the workings of this Association and co-operating with it, and paying annual dues shall become a member, upon signing the Constitution and By-laws thereof.

OFFICERS

Art. IV. The officers of this Association shall consist of a President, Vice-president, Secretary and Treasurer.

DUTIES OF THE OFFICERS

Art. V. Sec. 1. The President of the Association shall preside at all meetings of directors and stockholders and perform all duties pertaining to his office.

Sec. 2. The Vice-president shall preside in absence of the President.

Sec. 3. The Secretary shall keep a record of proceedings of all the meetings of the board of management and of the stockholders in the form of a minute book.

Sec. 4. The Treasurer shall be also the Business Manager, whose duties shall be to procure current prices and catalogues and to keep them on file, accessible to the board of management and in conjunction with them transact necessary business. The Treasurer shall collect, disburse and be liable for the custody and safe keeping of all funds and shall give a sufficient bond at the expense of the Association, amount to be fixed by the Board of Directors, for the faithful performance of his duties.

GENERAL MANAGEMENT

Art. VI. The management of this Association shall be lodged in a Board of Directors—a sufficient number to conduct the business—to be elected from the stockholders.

DUTIES OF DIRECTORS

Art. VII. Sec. 1. The Board of Directors shall have full management of the Association subject to the provisions of the laws, of the charter and of the by-laws of this Association.

Sec. 2. A majority of the Board of Directors shall constitute a quorum and a majority vote of those present is necessary on any question in order to carry.

Sec. 3. Vacancies in office and committees shall be filled for the unexpired term by the Board of Directors.

ELECTION OF DIRECTORS

Art. VIII. Sec. 1. The regular annual meeting of the stockholders of this Association, for the election of Directors, shall be on the first Thursday of January.

Sec. 2. The Directors shall be elected for a term of three years, a proportionate number to be elected annually.

STOCKHOLDERS

Art. IX. Sec. 1. A majority of the votable stock issued and outstanding, by the holders thereof either in person or by proxy shall constitute a quorum and be necessary to act at all meetings of stockholders for the election of officers and the conducting of all other business at all stockholders' meetings.

Sec. 2. Each stockholder is entitled to one vote in person or by proxy, for each share of stock as the same appears in his or her name on the records of the Association.

Art. X. Sec. 1. The members of the Association shall pay annually into the hands of the Treasurer of the General Association, the sum of fifty cents as membership fee.

Sec. 2. Each member holding stock shall have deducted annually by the Treasurer of the Association the dividend of one-share, which shall entitle the holder to a member's privilege.

Sec. 3. Only members shall be allowed the privileges of the Association.

TERMS

Art. XI. The terms of this Association are and shall be Cash.

COMPENSATION

Art. XII. The Board of Directors shall fix the salaries of all officers, agents and employes.

AUDITING COMMITTEE

Art XIII. Three stockholders when elected shall constitute an Auditing Committee whose duty shall be to audit the Treasurer's account annually.

BRANCHES OF THE ASSOCIATION

Art. XIX. Sec. 1. Fifteen or more members in a community holding stock can and shall, by the approval of the Board of Management, be recognized as a branch of the Association.

Sec. 2. Each Branch shall be entitled to respresentations in the general management as determined by the stockholders.

Sec. 3. Each Branch shall be locally responsible for their defalcation and shall not involve the Association in general in any financial liabilities for any local acts, and all local or Associate Business Managers shall give sufficient bond to the Association as determined by the Board of Directors for the faithful performance of their duties.

Sec. 4. Each Branch shall subscribe funds for the fixtures, equipment and stock necessary to properly conduct their local business and affairs, subject to the approval of the general board of management.

MEETINGS

Art. XV. Sec. 1. The President or any four members of the Board of Directors may call a special meeting of the stockholders, giving due notice, not less than ten days.

Sec. 2. The Directors shall meet after each election and organize by choosing a President, Vice-president, Secretary and Treasurer, and meet as often thereafter as necessary for the general welfare of the Association.

Art. XVI. Sec. 1. Each local branch shall have authority to regulate its own local or internal affairs in any way not violating charter or by-laws of the General Association.

Sec. 2. These by-laws shall govern the Lancaster County Farmers' Association and all its branches, under the provisions of the charter thereof.

Art. XVII. The stockholders by a vote of the majority of shares of stock outstanding may at any annual or special meeting alter or amend these by-laws if notice thereof be contained in the call for the meeting.

BY-LAWS FOR CO-OPERATIVE ASSOCIATIONS

BY FRANKLIN MENGES, PH: D.

NAME

This organization shall be known as the FARMERS' PRODUCERS AND CONSUMERS CO-OPERATIVE ASSOCIATION.

CENTRAL OFFICE

The principal office of this association shall be at York, York County, Pennsylvania.

OBJECT OF THE ASSOCIATION

The objects of this Association are to unify and promote the interests of its members in agricultural, horticultural, manufacturing and commercial pursuits, including the producing, trading in and dealing in goods, wares, implements, chattels, grains, vegetables, fruits and other general products, and in buying, selling, holding and leasing or improving the lands, tenements or buildings, and for the further purpose of promoting social culture, moral reform and intellectual advancement, and bringing about a direct connection and relation for mutual benefit between the producers of farm, manufactured, mining and other products and the consumers of the same.

CAPITAL STOCK

The capital stock of this association shall be variable capital to be paid in is $2,000.00.

MEMBERSHIP

All citizens of the community in which this association is located, or a branch thereof, who are in sympathy with its objects and are willing to co-operate with it in the accomplishment of its purposes, and pay annual dues of one dollar per member and own at least one share, and not more than fifty shares, of full paid stock in the association shall become members and shall enjoy all the benefits, privileges and emoluments it confers, together with the right to cast one vote in person, and not by proxy, in all elections of officers, and for the transaction of all other business of the association.

ASSOCIATE MEMBERS

All citizens of a community in which the association is located, or a branch thereof, not desiring to become regular or stockholding members, but who in all other respects are willing to co-operate with it in the accomplishment of its purposes may, upon the payment of an entrance fee of one dollar, and thereafter annually a membership fee of one dollar, become associate members and shall enjoy all benefits and privileges of the association, except that they shall pay $2\frac{1}{2}\%$ more than the stockholding members for all purchases whatsoever made for them through the association and all costs for making sales through the association, and in no wise shall they be eligible to vote or hold office in the association.

OFFICERS

The officers of the association shall be a President, Vice-President, Secretary and Treasurer, and a Board of Directors composed of six members. All officers to be eligible to hold office must be stockholders in the association and shall hold office for one year, or until their successors are duly elected and qualified.

ELECTIONS

The officers of the association shall be elected at the first quarterly meeting of the stockholders in each year, to be held at the central office of the association, or at the central office of any branch association, on the third Tuesday of January, at which meeting a majority of the stockholders of the association shall be represented in person and vote in person, as hereinbefore provided, for the election of all officers, and for the transaction of all other business. The other quarterly meetings of the association shall be held on the third Tuesday in April, July and October.

DUTIES OF THE PRESIDENT

The President shall preside at all meetings of the stockholders, and shall call special meeting whenever necessary, or whenever ten per cent. of the record stockholders shall request him in a petition duly signed by the required number of stockholders to do so. He shall be ex-officio a member of all committees. He shall sign all vouchers issued by the General Manager, and those authorized by the Board of Directors, and attested by the Secretary of the association, for the payment of all claims of indebtedness incurred in the business transactions of the association. The Vice-President shall preside in the absence of the President and shall in his absence perform the duties of the President as hereinbefore stated.

DUTIES OF THE SECRETARY

He shall be the Secretary of the stockholders and the Board of Directors. He shall keep accurate minutes, in books provided for the purpose, of the proceedings of all meetings of the stockholders, as well as the Board of Directors. He shall keep the minutes of both the stockholders and Board of Directors open and accessible for the inspection of all stockholding and associate members. He shall give due notice of all regular and special meetings of stockholders, at least ten days before such meeting, to all stockholders at their recorded address. He shall, after due examination and verification, sign all vouchers issued by the General Manager, and the Board of Directors, for the payment of all claims of indebtedness of the association, and perform all other such duties as pertain to his office.

DUTIES OF THE TREASURER

All moneys due the association, whether derived from the sale of stock issued by the association, or from entrance fees, annual dues, or from the sale of all kinds of property whatsoever, real, personal or mixed, made by the Board of Directors or the General Manager of the parent association for it, or its stockholding or associate members, or any branch association, its stockholding or associate members, shall be paid into the hands of the treasurer of the parent association, for which he shall give a legal receipt. All indebtedness of the association, whether dividends on the stock issued by the association, declared by the Board of Directors, or indebtedness incurred in the purchase of all kinds of property whatsoever, real, personal or mixed, made either by the Board of Directors or the General Manager of the parent association for the parent association, its stockholding or associate members, or for a branch association, its stockholding or associate members, shall be paid by the Treasurer upon presentation of proper voucher, except that when such indebtedness is incurred for any branch association, its stockholding or associate members, before paying any such indebtedness the Treasurer shall be reimbursed by the Treasurer or the members of such branch association. The Treasurer shall keep an accurate account of the outstanding and unissued stock of the association, as well as all moneys paid him by members in membership fees, annual dues, and that derived from the sales and business transaction of the association. He shall deposit all moneys and valuable effects of the association to the credit of the association in depositories designated by the Directors of the association. He shall so far as necessary keep a separate account with each individual doing business with the parent association. The books of the Treasurer shall be audited quarterly by a committee of two elected by ballot annually by the stockholders at their January meeting. The Treasurer's books shall be open at all times for the inspection of all stockholding and associate members. The Treasurer shall give bond in such amount as the Board of Directors shall require.

BOARD OF DIRECTORS

The Board of Directors shall meet for organization on the first Tuesday after their election, and shall elect a presiding officer either from among themselves, or they may make the President of the stockholders their presiding officer without a vote in the transaction of their business. A majority of the Directors shall be necessary for a quorum to transact business. They shall elect a business manager, who, in co-operation with and by the advice of the Directors, shall manage the business of the association. He shall be a man of known practical, honest, successful business experience and ability. All purchases or renting of real estate upon which to erect buildings, or real estate with buildings for storerooms, warehouses and equipments for all other storing purposes, and manufacturing plants and other necessary buildings, and for yardage and railroad sidings and other necessary trackage, shall be made for the association by the Board of Directors, with the advice and co-operation of the President of the stockholders. All real estate, buildings, manufacturing plants, storage plants of all kinds whatsoever, railroad sidings railroad trackage, and all other railroad equipment, and all other equipments whatsoever shall be under the management and control of the Board of Directors for the association. All sales of real estate, buildings, manufacturing plants, storage plants, railroad sidings, railroad trackage, railroad equipment, and all other equipment whatsoever shall be made for the association by the Board of Directors, and their deed, release or receipt shall be sufficient guarantee to title. All contracts for the erection and furnishing of buildings, and the repairing of the same, shall be made by the Board of Directors, with the consent of the President of the stockholders. A true copy of all agreements or options for the purchase or sale of the property above described, also a copy of all contracts for the erection and equipment of buildings as above specified, and for railroad equipment, shall be sent to all stockholders of record for their inspection at least thirty days before the final purchase of such real estate, buildings or equipment, or the final signing of contracts for erecting and equipping buildings. Should ten per cent. of the record stockholders, voting as hereinbefore provided, petition the President of the stockholders ten days previous to the final purchasing of real estate or buildings, or the final signing of contracts for erecting and equipping buildings, to call a meeting of the stockholders to approve, modify or reject the action of the Board of Directors, he shall de so within ten days after the receipt of such petition. A majority vote of the stockholders present who shall represent at least 66⅔% of the votable stock of the association shall be necessary to approve, modify or reject the action of the Board of Directors in which the Board of Directors shall not vote, neither shall their stock be represented. All dividends, not to exceed five per cent. on the stock issued by the association shall be declared by the Board of Directors. The salaries of all officers and employees of the association shall be fixed by the Board of Directors, except their own which shall be a per diem and shall be fixed by the stockholders at their January meeting, voting as hereinbefore provided. All salaries of officers and the per diem of the Directors shall not exceed five per cent. of the total financial business transactions of the association, exclusive of the purchase or sale of real estate, buildings, etc., their construction and repair. The stockholders, if not satisfied with the salaries as fixed by the Board of Directors, may at an annual meeting by a majority vote, voting as hereinbefore provided, increase or decrease the salaries of any or all officers of the association. Any stockholding member of this association who is directly or indirectly acting as agent or representative of a manufacturing, jobbing, wholesaling and retailing concern, or any combination whatsoever of these, shall not be eligible as member of the Board of Directors.

GENERAL MANAGER

All orders for purchases of machinery of all types whatsoever, of fertilizing materials, and mixed fertilizers, seeds of all varieties, farm products of all kinds, animals of all species, raw and manufactured materials, fuel of all kinds, building materials of all kinds, tiling merchandise of all kinds whatsoever, made by the stockholders or associate members of the parent, or any branch association, shall be filled by the General Manager. The General Manager shall sell to the best advantage for the stockholding and associate members of the parent or any branch association all farm and manufactured products of all kinds whatsoever, raw materials of all kinds, animals of all species, and animal products of all kinds, whenever requested to do so. He shall give invoices of all shipments to all branch associations made to them or their members. He shall give a receipt and invoice giving the names, quantities, quality and condition of the products to the one furnishing these and retain a copy for himself, and send a copy to the Secretary of the association. He shall keep in touch with all reliable consuming agencies, especially consumers co-operative associations, for selling what is offered, and with manufacturers and producers for buying what is desired, and shall keep in his office catalogues and price lists on file for the use of the members. All orders filled by him for stockholding and associate members, or branch associations, their stockholding or associate members, shall be paid in cash or its equivalent. The sales made by the General Manager for stockholding and associate members of the parent or any branch association shall be paid within five days after the Treasurer has received the money for the same. The expenses incurred in making these sales shall be deducted before such payment is made. The General Manager shall make all bills payable to the Treasurer, and all vouchers by the Treasurer. The General Manager's records of purchases and sales made for stockholding and associate members shall be open for inspection to all such members.

BRANCH ASSOCIATIONS

Ten or more stockholding members in the parent association, or ten or more individuals who are not stockholders in the parent association, but are willing to co-operate with it in the accomplishment of its purposes, who live within reach of a business or shipping point, who own ten or more full paid shares of stock at $10.00 per share in a local association shall, if their constitution or by-laws do not conflict with these by-laws, be recognized as a branch of the parent association. Each branch association shall be financially responsible for its equipment and for what ever property, real, personal or mixed, that may be necessary for conducting its business. The stockholding and associate members of branch associations shall not assist in any way in paying dividends on the stocks of the parent association. All orders drawn on the General Manager for purchases or products as enumerated under "Duties of the General Manager" desired by branch associations, their stockholding and associate members shall be filled by him. All such purchases together with the expenses incurred by the General Manager in the procuring of the same shall be paid in cash or its equivalent, and in no wise shall the parent association be financially responsible for such payments until reimbursed by the branch association or its members. The members of the Board of Directors of all branch associations who are not stockholders in the parent association shall have one vote each in the election of all officers in the parent association, but not in the transaction of any other business. Copies of invoices stating the quantity, quality and conditions of all shipments whatsoever made by any branch association to be sold by the General Manager of the parent association shall be furnished by such branch association for the General Manager and the Secretary of the parent association. Any offers of a higher price or prices for any of the products whatsoever of the quality sold through the General Manager of the parent association and enumerated under his duties, and a lower price of the same quality for those purchased through him and also enumerated under his duties, made by any consuming or producing agency, or any combination of these whatsoever, to any member or members of the parent association, or any branch association, member or members thereof, may be accepted by either or all of them but such purchasing or selling prices shall be at once communicated to the General Manager of the parent association and shall become available for the parent association, its stockholding and associate members, and all branch associations, their stockholding and associate members. The refusal or neglect of any stockholding or associate member in the parent association, or any branch association, its stockholding and associate members, to make such communication to the General Manager of the parent association shall be deemed sufficient reason for the Board of Directors of the parent association to withdraw the privilege of buying or selling through it by any such member or members, or branch association or associations. This provision shall not be construed to include purchases or sales that may be made locally.

STOCK

The par value of the stock of this association shall be ten dollars a share. All certificates of stock shall be signed by the President and Secretary of the association. The money derived from the sale of stock of the association shall be used for the purchase of real estate, buildings and necessary equipment, and in the case of the association desiring to keep the products enumerated on hand for the benefit of members may by and under the management of the Board of Directors use the money derived from the sale of such stock for such purchase.

UNASSOCIATES

All people desiring to buy or sell through the association who are neither stockholding or associate members in the parent or any branch association shall be allowed such discount on purchases and rates for selling as the Board of Directors may determine.

EXPENSES

To all purchases made by the General Manager for the parent association, its stockholding and associate members, or a branch association, its stockholding and associate members, shall be added all necessary expenses incurred in the procuring of such purchases, and such dividends up to five per cent. as the Board of Directors may declare. With this addition the stockholding members shall receive all purchases at cost, while to all purchases made for associate members two and one-half per cent. shall be added, which may be used if they so desire to purchase stock in the parent association or a branch thereof.

THE TERM OF EXISTENCE OF THIS ASSOCIATION IS THIRTY YEARS

These by-laws may be changed or amended by a majority vote of the stockholders at a regular or special meeting, provided that a notice of the proposed change or amendment shall have been sent by the Secretary to each stockholder of record at least sixty days previous to such meeting.

Commonwealth of Pennsylvania

DEPARTMENT OF AGRICULTURE

BULLETIN No. 222.

PROCEEDINGS OF THE THIRTY-FIFTH ANNUAL MEETING

OF THE

Pennsylvania State Board of Agriculture

HELD IN THE

CAUCUS ROOM, HOUSE OF REPRESENTATIVES, HARRISBURG, PA.

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